

copy 2
S/S beg 8 July 1994

FM 34-130

**INTELLIGENCE PREPARATION
OF THE BATTLEFIELD**

MAY 1989

**HEADQUARTERS,
DEPARTMENT OF THE ARMY**

Pentagon Library (ARR-PL)
ATTN: Military Documents Section
Room 1A518, Pentagon
Washington, DC 20310-6050

DISTRIBUTION RESTRICTION: Approved for public release:
distribution is unlimited.



.



FIELD MANUAL
NO 34-130

FM 34-130
HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 23 May 1989

INTELLIGENCE PREPARATION
OF THE BATTLEFIELD

Table of Contents

	Page
Preface	iii
CHAPTER 1 - Why Intelligence Preparation of the Battlefield?	1-1
CHAPTER 2 - Development and Use of Intelligence Preparation of the Battlefield Products	2-1
Graphics	2-1
Templates	2-1
CHAPTER 3 - Intelligence Preparation of the Battlefield Effort	3-1
CHAPTER 4 - Intelligence Preparation of the Battlefield Process	4-1
Battlefield Area Evaluation	4-1
Terrain Analysis	4-6
Weather Analysis	4-32
Threat Evaluation and Doctrinal Templating	4-42
Threat Integration	4-53
CHAPTER 5 - Intelligence Preparation of the Battlefield Support	5-1
Combined Arms Team	5-1
Staff Planning	5-2
Situation Development	5-3
Electronic Warfare	5-5
Battlefield Deception	5-6
CHAPTER 6 - Intelligence Preparation of the Battlefield--The Systematic Approach	6-1
APPENDIX A - Tactical Intelligence Preparation of the Battlefield	A-1
APPENDIX B - Intelligence Preparation of the Battlefield in the Urban Battle	B-1
APPENDIX C - Intelligence Preparation of the Battlefield in Air Defense, Counterair, and Air Operations	C-1

	Page
APPENDIX D - Operational Level of War	D-1
APPENDIX E - Intelligence Preparation of the Battlefield in Counterinsurgency Operations	E-1
APPENDIX F - Electronic Preparation of the Battlefield	F-1
APPENDIX G - Intelligence Preparation of the Battlefield in Rear Operations and Rear Area Operations	G-1
GLOSSARY	Glossary-1
REFERENCES	References-1
INDEX	Index-1

Preface

The purpose of this publication is to emphasize the vital role that intelligence preparation of the battlefield (IPB) plays in preparing for the next battle. It focuses on specific IPB requirements that have developed as a result of the AirLand Battle Doctrine and previous detailed instructions on how to apply IPB in previously unconsidered areas. The concepts presented in this publication are not radically new. However, as doctrine has shifted, these concepts have moved to the forefront of our concern and must be given in-depth consideration.

The primary function of this publication is to provide the commander with the latest IPB doctrine. It also provides guidelines on how the commander may apply IPB in specific situations. These situations include offensive and defensive operations; support to rear operations; urban operations; air defense artillery (ADA), counterair, and air operations; counterinsurgency operations (COIN); the operational level of war; and electronic warfare (EW). While this publication is not intended to be all-inclusive, the material presented is in accordance with current US Army doctrine in the areas concerned. It is intended to be as complete as possible.

This publication describes the IPB process and how to use IPB as a basis for counterintelligence (CI), situation development, target development, battlefield deception, and EW operations. It concentrates on building IPB data before hostilities, and outlines its applicability to tactical operations.

This publication is intended to serve as a guide. No part of this document should be construed as limiting commanders' freedom of action or committing them to a fixed or particular course of action. Nor should any part of this document be construed to imply that all graphics depicted must be prepared by all commands in all situations. Rather, commanders may apply the information presented in any manner appropriate to the particular mission and situation.

Although this publication applies to all members of the active Army, Army Reserve, and Army National Guard, it is primarily intended for use by unit commanders and staffs at all echelons. Specific portions and sections are also intended to be of use, or interest to, commanders and staffs of joint and combined commands; units of the US Air Force and Allied air forces; Marine and Naval forces of the US; and Allied countries and other intelligence agencies.

Information in this publication which expands upon IPB doctrine will be incorporated into FM 34-1 and FM 34-3 upon normal review.

The proponent of this publication is HQ TRADOC. Submit changes for improving this publication on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forward it to Commander, US Army Intelligence Center and School, ATTN: ATSI-TD-PAL, Fort Huachuca, AZ 85613-7000.

CHAPTER 1

WHY INTELLIGENCE PREPARATION OF THE BATTLEFIELD?

IPB is the key for preparing for the next battle. During peacetime, IPB builds an extensive data base for each potential area in which a unit may be required to operate. It analyzes this intelligence data base in detail to determine the impact of the enemy, weather, and terrain on operations and presents this information graphically. IPB is initiated any time the commander faces a new enemy or receives a new mission. It is initiated prior to hostilities and is adaptable to contingency situations. It is a continuous process which supports planning and execution for all operations.

IPB is an analytical methodology employed to reduce uncertainties concerning the enemy, weather, and terrain for all types of operations. The development of AirLand Battle Doctrine has rejuvenated interest in offensive operations and created the need for offensive IPB. Offensive IPB is not a new concept, but a refinement of current IPB doctrine.

AirLand Battle Doctrine also focuses on rear operations and the need for IPB in support of rear operations. While the focus of IPB for rear operations and rear operations support differs from that of offensive and defensive IPB, the concept is not new. Rear area logistics and security unit commanders have always had to analyze the area of operations (AO) to determine the potential effects of enemy capabilities, weather, and terrain on support and security operations.

Another aspect of IPB that has not been doctrinally emphasized is what is called the "third dimension" of the battlefield--airspace. IPB has traditionally emphasized the first two dimensions--width and depth. However, modern and dynamic warfare requires that the commander be able to visualize the enemy air threat (both fixed and rotary wing) and understand the use of friendly aviation and air defense assets.

IPB integrates enemy doctrine with the weather and terrain to determine and evaluate enemy capabilities, vulnerabilities, and feasibility of enemy courses of action. IPB products support commanders and their staffs in the decisionmaking process. IPB provides a graphic intelligence estimate that portrays probable enemy courses of action, and a graphic operations order (OPORD) that allows the commander to dictate rather than to react to the battle. Once hostilities begin and updated information becomes available, the graphic intelligence estimate, or OPORD, becomes dynamic, changing with the battlefield situation.

IPB helps the commander control the battle by telling the commander when the enemy can most easily enter the battle area and where and when follow-on forces should be moving. For battlefield deception, the IPB process assists in determining deception objectives; developing deception events, plans, and stories; and focusing the collection process to

determine if deception operations are being accepted, rejected, or deceptively countered by the enemy. The IPB process assists in situation and target development by showing the commander when and where the enemy can most effectively be engaged by fire, maneuver, and EW means, and when the initiative can be seized.

Using IPB graphics, the commander and staff can identify high value targets (HVTs) and high payoff targets (HPTs) as they enter the battle area. HPTs that support the commander's concept of operation will be attacked, thus reducing the effectiveness of enemy forces; disrupting and delaying them; and creating further targets for maneuver, fire support, and EW elements.

When applying IPB doctrine in counterinsurgency (COIN) operations, the commander must adapt to a specific situation which will be unique to that environment. The nature of COIN makes it essential that the IPB effort is applied as early as possible against the insurgent movement. Prior to force commitment, during Phase I (logistics building) and Phase II (hit and run operations against host country) of the insurgency, commanders must effectively collect, process, and focus on intelligence to prevent Phase III from developing. The application of IPB to COIN operations is essential if Phase III (conventional conflict) is to be avoided.

CHAPTER 2

DEVELOPMENT AND USE OF INTELLIGENCE PREPARATION OF THE BATTLEFIELD PRODUCTS

Graphics are basic to IPB analysis. Intelligence is often best communicated with pictures.

GRAPHICS

IPB products include annotated military maps, multilayered overlays, gridded photographs, and microfilm and large-scale map substitutes which are all capable of computer-assisted display, manipulation, and compilation. Battlefield analysis and the intelligence estimate are not replaced but are converted to graphics whenever possible. These graphics become the basis for intelligence and operational planning. Information is kept current by replacing or updating the graphics.

Currently, most IPB graphics are prepared manually through a slow, time-consuming process. Eventually, automated data processing (ADP) systems will assist the analyst in the IPB process. ADP system data storage and update capabilities will reduce the time required to prepare graphics. The obvious benefits of automated graphic analysis and intelligence displays will outweigh the high initial investment of time and resources in their development. The intelligence community is giving a high priority to developing these systems. Once these systems become available and are prepared properly, IPB graphics are inexpensive and simple to maintain.

The products developed through IPB support many battlefield functions. They are most valuable to the commander's operations and intelligence staff. IPB accomplished before the battle identifies gaps in the intelligence data base and, where possible, allows these gaps to be filled before the first shot is fired. Requirements that cannot be satisfied become urgent priorities in support of the battle plan. IPB provides the basis for a dynamic collection plan, and serves as a guide for the effective employment of collection, reconnaissance, surveillance, and target acquisition assets.

TEMPLATES

Threat evaluation and integration are accomplished through the analytical technique known as templating. Templates are graphic illustrations (normally drawn to scale) of enemy force structure, deployments, or capabilities. They provide a basis for directing the collection effort in order to see the battlefield, for command estimates and for resource allocation decisions.

Templates provide a comparative intelligence data base for integrating what we know about the enemy with the weather and terrain for a specific area. They enable us to graphically depict enemy capabilities, predict probable enemy courses of action before the battle, and to confirm or

refute our predictions after hostilities begin. Templates are dynamic, providing a means for the continuous assessment of enemy capabilities and vulnerabilities, while being subject to change as the situation dictates. They may portray a variety of enemy characteristics such as force dispositions, defensive fortifications, and weapons and equipment. Templates may be used for battlefield functional systems such as artillery, ADA, engineers, command and control (C²), and tactical air support.

Figure 2-1 shows the four principal types of templates developed and employed during the IPB process.

The graphic intelligence data bases developed and maintained throughout the IPB process provide the basis for collection and analysis in support of situation and target development. They provide a means for projecting significant battlefield events and enemy activities and for predicting enemy intentions. Comparing these data bases with events and activities as they occur provides the commander with complete, timely, and accurate intelligence.

TEMPLATE	DESCRIPTION	PURPOSE	WHEN PREPARED
Doctrinal	Enemy doctrinal deployment for various types of operations without constraints imposed by the weather and terrain. Composition, formations, frontages, depths, equipment numbers and ratios, and HVTs are types of information displayed.	Provides the basis for integrating enemy doctrine with terrain and weather data.	Threat Evaluation.
Situation	Depicts how the enemy might deploy and operate within the constraints imposed by the weather and terrain.	Used to identify critical enemy activities and locations. Provides a basis for situation and target development and HVT analysis.	Threat Integration
Event	Depicts locations where critical events and activities are expected to occur and where critical targets will appear.	Used to predict time-related events within critical areas. Provides a basis for collection operations, predicting enemy intentions, and locating and tracking HVT.	Threat Integration
Decision Support	Depicts decision points and target areas of interest keyed to significant events and activities. The intelligence estimate in graphic form.	Used to provide a guide as to when tactical decisions are required relative to battlefield event.	Threat Integration

Figure 2-1. IPB templates.



CHAPTER 3

INTELLIGENCE PREPARATION OF THE BATTLEFIELD EFFORT

The development of IPB products is labor-intensive. It requires the dedicated efforts of intelligence and other staff personnel, the direction and focus of the commander, and the cooperation of numerous other elements within the command. IPB is a formal process at division and higher echelons. Combat support (CS) and combat service support (CSS) units routinely expand upon and use products developed at division and corps main command posts (CPs) at brigade, battalion, and tactical and rear CPs. At brigade and battalion the IPB process is more informal, becoming more formal only when time and resources permit. Each level of command provides IPB support and products for its subordinate elements. Subordinate elements are expected to expand on the provided IPB support based on their specific mission.

It therefore becomes the critical responsibility of the commander to conduct the IPB process for a particular AO and area of interest (AI). While commanders will be concerned with the potential effects of the enemy, weather, and terrain on all operations, forward maneuver commanders direct their attention toward enemy fire, maneuver, and EW capabilities. The designated rear operations commander is more concerned with enemy airborne and air assault capabilities, long-range weapons, potential security, and insurgent and terrorist threats, while using IPB to effectively emplace support elements.

The commander and the mission begin and drive IPB. The commander analyzes the mission, then restates the mission, and provides planning guidance to the staff. The planning guidance should contain the commander's priority intelligence requirements (PIRs). If the commander does not state the PIRs, IPB will identify critical gaps which will assist the staff in developing these PIRs. As the IPB process is a combat synchronization tool, the staff effort becomes a synchronization effort.

The G2 or S2 provides the staff with the current enemy situation, to include the potential enemy courses of action. These become the basis for the staff estimates. When staff estimates for all potential enemy courses of action have been prepared, the staff wargames the potential friendly and enemy courses of action and determines the most probable course of action based on all factors. The staff then develops decision support templates (DSTs) for the most likely enemy course of action and probable branches and sequels.

The staff then briefs the commander on the DST. The commander wargames the DST to ensure that all potential enemy courses of action have been considered and that all friendly actions and intent have been integrated. The commander then updates the PIRs based on the DST and issues a decision and concept of the operation. This includes directing changes or additions to the DST.

Plans and orders are prepared based on the commander's decision or concept. This includes the final version of the DST which becomes a synchronization graphic. Once approved, the plans or orders, to include the DST, are issued to subordinate or functional commanders. At the subordinate functional level, the DST is expanded or refined as the mission or commander's concept dictates. Figure 3-1 shows how IPB fits into the commander's decisionmaking process, as discussed in FM 101-5.

The intelligence staff is the nucleus of the IPB effort. It includes the G2 or S2, intelligence analysts of the all-source production section (ASPS), the engineer terrain detachment, and the United States Air Force (USAF) weather team (WETM). They are assisted by other agencies from within and outside the command which have expertise in particular areas. National level agencies and production centers and echelons above corps (EAC) headquarters provide many of the basic IPB products.

The G2 or S2 serves as the IPB coordinator and drives the IPB process. The G2 or S2 ensures that the PIRs are satisfied according to the commander's guidance. The ASPS or battlefield intelligence coordination center (BICC) assembles the threat data base, converts it to graphics, and integrates it with weather and terrain data. The ASPS or BICC develops the IPB products used to support combat operations.

During the IPB process, the G2 or S2 coordinates extensively with the G3 or S3, fire support coordinator (FSCORD) or fire support officer (FSO), air defense officer, air liaison officer, battlefield deception element, engineer officer, the terrain detachment, and the WETM. This coordination is expanded to support the initial preparation of rear area IPB information. The G2 or S2 coordinates with the G4 or S4, the transportation officer, the CI officer, the civil affairs officer, and other combat support and CSS officers in addition to the normal coordination.

The engineer terrain detachment analyzes the terrain to determine its impact on tactical operations. The division detachment develops terrain factor overlays, special terrain studies, and weather effects overlays. The detachment receives support from the general support (GS) engineer topographic company at corps and from the engineer topographic battalion at EAC.

The USAF WETM provides weather products, some of which may be based on climatic data. It may draw upon the resources of the USAF Air Weather Service (AWS) for historical, current, and projected weather information for the entire AO and AI. AWS units at EAC provide weather support to division and corps WETMs; a USAF WETM deploys with and provides direct support to the echelons above corps intelligence center (EACIC).



CHAPTER 4

INTELLIGENCE PREPARATION OF THE BATTLEFIELD PROCESS

The IPB process integrates enemy doctrine with the weather and terrain and relates these factors to the mission and specific battlefield situation. It provides a basis for determining and evaluating enemy capabilities, vulnerabilities, and probable courses of action. It also serves as the planning basis for the formulation of the unit's concept of operations and for the allocation of combat power as reflected in the unit's organization for combat. The process is especially critical to the intelligence officer (G2 or S2), the operations officer (G3 or S3), the battlefield deception element, and the field artillery intelligence officer (FAIO).

Like the intelligence cycle, the IPB process is cyclic in nature. All IPB functions are performed continuously and simultaneously. Figure 4-1 depicts the IPB process.

Battlefield area evaluation assesses the AO and AI and is the basis for the analysis of the terrain, weather, and threat forces. Terrain and weather analysis may be accomplished in sequence or simultaneously with threat evaluation. Regardless of the analytical sequence, the final step is threat integration. It integrates weather, terrain, enemy and friendly force information, and determines their combined effects on operations.

IPB provides situation and target information with which to compare friendly and enemy courses of action. This information is used to predict enemy activity and to produce event-related forecasts of battlefield operations. Often, it allows the commander to shape the battlefield through the deliberate execution of certain operations, like the engineer obstacle plan, to cause certain battlefield events to unfold as desired. The information required to develop IPB comes from all available sources. These sources include current intelligence holdings, information from higher headquarters, or information from supporting agencies. This information includes, but is not limited to, order of battle (OB) data, weather and terrain data, all-source intelligence input, technical intelligence data, nuclear, biological, and chemical (NBC) data, air defense data, aviation data, field artillery data, engineer data, and transportation and logistics data.

The intelligence officer develops specific information requirements concerning weather, terrain, and threat forces within the AO. The resultant information is then used to develop and update the data base. The information includes all types of OB data.

BATTLEFIELD AREA EVALUATION

Battlefield area evaluation involves assessing the battle area with regard to the overall nature of the friendly and enemy forces and the operating environment. The terrain and weather are evaluated to determine

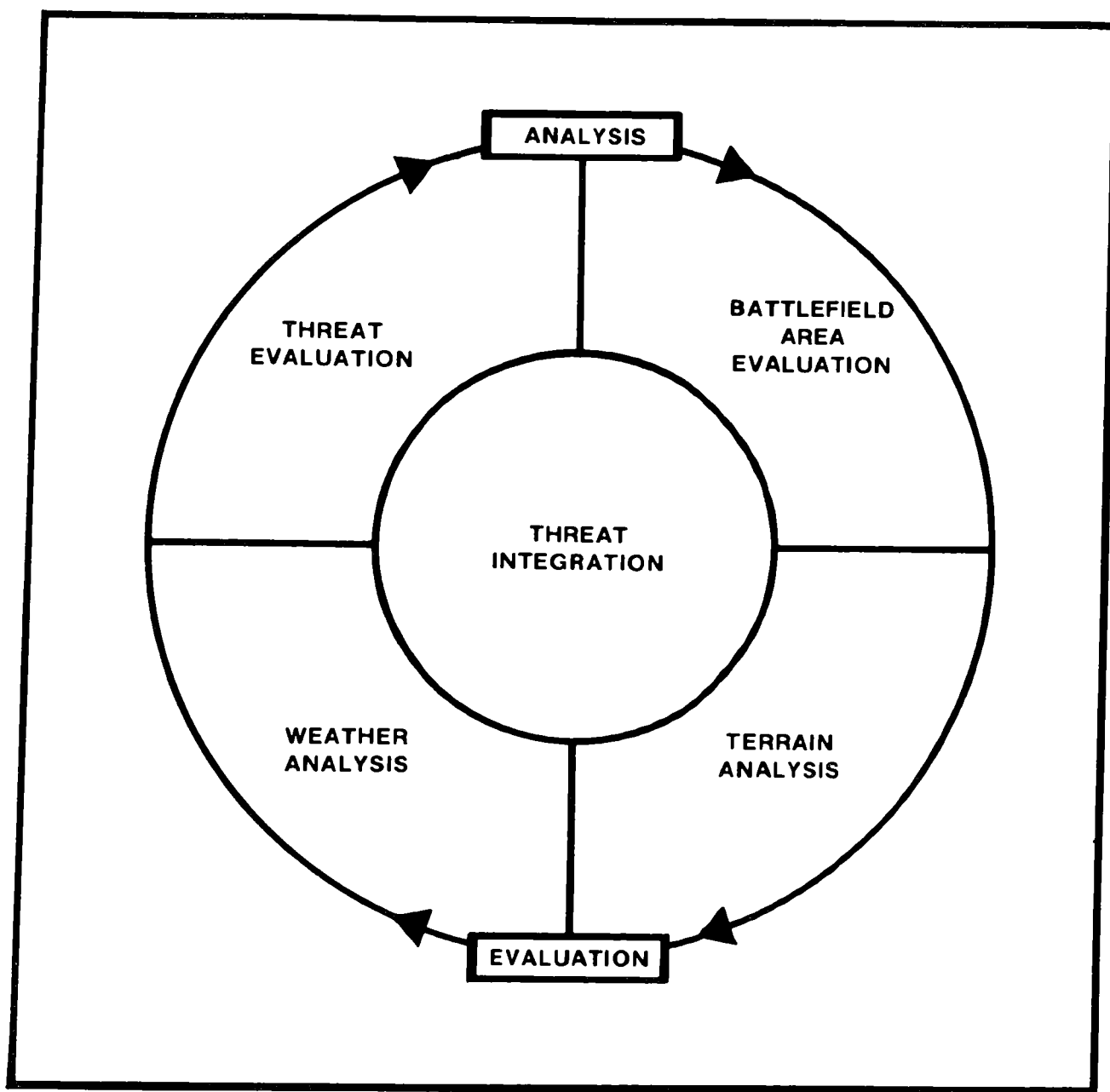


Figure 4-1. IPB process.

how they will affect operations in general. Enemy forces (including ground and air and, when appropriate, naval forces) which are expected to operate within the battle area are evaluated to determine their capabilities in relation to the weather, terrain, and friendly mission. Battlefield evaluation should call attention to significant areas and features that must be considered during the IPB effort. It assists the

IPB analyst in determining what information, products, and support will be required to complete the IPB.

The battlefield consists of the AO and the AI. These areas are viewed in terms of width, depth, height (airspace), electro-optical factors, and time, with time being the most critical.

The AO is the geographical area where the commander has been assigned the responsibility and authority to conduct military operations. The assigned AO is based on mission, enemy, terrain, troops and time available (METT-T) factors and planning considerations beyond the forward line of own troops (FLOT) (or objective). Figure 4-2 shows the planning consideration times for establishing the AO for the echelons of battalion through EAC.

During offensive operations, the AO will include the command's axes of advance or direction of attack and the designated objectives.

COMMAND ECHELON	AREA OF OPERATIONS (HOURS)
Battalion	0-3
Brigade	0-12
Division	0-24
Corps	0-72
EAC	72+

Figure 4-2. AO times.

The air AO is identical to the ground AO in that air bases, refueling points, landing zones (LZs), drop zones (DZs), and air defense weapons and radars operate within the command's boundaries. The major difference between air and ground operations is the height (the third dimension) or operating ceiling within which fixed and rotary-wing aircraft operate and air defense weapons can fire. The height of air operations is tempered by aircraft ceilings and the effective altitudes of air defense weapons systems such as antiaircraft artillery (AAA) and surface-to-air missiles (SAMs) (for example, the airspace ceilings and air defense limits of responsibility prescribed in joint and Allied doctrine).

The rear AO differs from the forward AO (close and deep) in that it includes a geographical area where higher and lower echelon support and security and air defense elements are conducting operations simultaneously. While the rear area is defined by the same width, depth, height, electro-optical, and time factors as the forward areas, specific factors relating to the civil population, CI, security, psychological operations (PSYOP), and civil affairs impose special considerations. Figure 4-3 shows the battlefield areas.

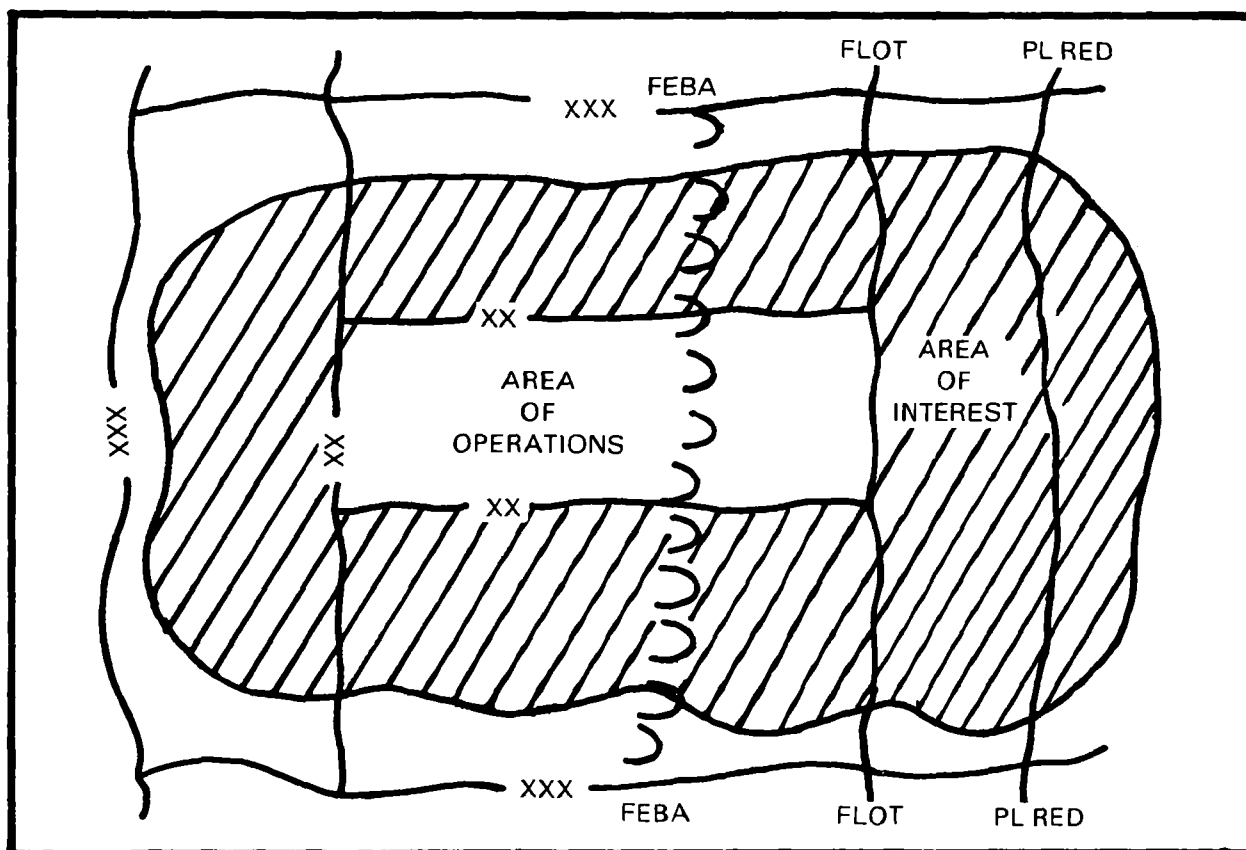


Figure 4-3. Battlefield areas.

The AI is based on METT-T and the commander's concept of the operation. It should include all enemy activities which might affect the friendly force throughout the time of the operation in question. The G2 or S2 recommends the AI to the commander based on IPB. Following the commander's approval, the G2, S2, or ASPS forwards the limits of the AI to the next higher echelon, where it serves as a guide for supporting intelligence requirements. The AI for offensive operations will generally be larger than during defensive operations because of the need to be aware of

potential counterattacking forces on flanks and reinforcements on or beyond the objectives as the attacking force penetrates the battle area. Like the AO, the AI uses planning consideration times to provide a basic set of guidelines for determining its limits. Figure 4-4 shows the planning consideration times used in determining the AI for the echelons of battalion through EAC.

COMMAND ECHELON	AREA OF INTEREST (HOURS)
Battalion	Up to 12
Brigade	Up to 24
Division	Up to 72
Corps	Up to 96
EAC	Over 96

Figure 4-4. AI times.

The air AI is normally much larger than the ground AI, primarily because of the great distances enemy aircraft can rapidly cover and the speed with which they can influence friendly operations. The air AI encompasses enemy airfields, refueling and rearming points, SAM sites, and air defense early warning radar (EWR) and ground-controlled intercept (GCI) sites. The air AI extends upward to the maximum ceiling of enemy aircraft and to the maximum effective altitudes of friendly and enemy air defense systems.

The rear operations AI may include an area as large as a theater of operations, a theater rear area, or a communications zone (COMMZ). The area must extend into enemy territory as combat support and CSS units must be prepared to move into areas formerly occupied by the enemy. The rear AI may overlap the AIs of other rear area commanders, as well as other rear AOs. The rear operations AI for air is extremely large due to the rapid potential impact of enemy air operations on rear area support and security operations.

The G2 or S2 evaluates the terrain, weather, and enemy and makes recommendations regarding the determination of subordinate unit boundaries to the G3 or S3. The G3 or S3 uses the G2's or S2's recommendations to

determine recommended subordinate unit boundaries and to allocate resources. The recommended boundaries are then submitted to the commander for approval.

When the battlefield area has been defined, the analyst determines and assembles the information and materials required to complete the IPB process. Basic requirements include maps and the materials necessary for template and overlay preparation; normal climatic, weather, and encyclopedic data, and area studies that completely cover the battlefield area. Standard military topographic maps at a scale corresponding to the echelon conducting the IPB are obtained for the areas of concern. When available, airspace analysis may be accomplished using the standard 1:250,000 air and radar Joint Operations Graphics (JOG) specifically designed for this purpose. For detailed analysis of an aircraft's approach to a target, standard 1:50,000 topographic maps are useful.

Standard topographic maps, however, do not provide sufficient detail for terrain analysis. The special maps and terrain products are obtained through the division terrain detachment, or corps terrain analysis team, from the theater engineer topographic battalion, or through the Defense Mapping Agency (DMA). These products include special map data base overlays which depict surface drainage, surface materials, vegetation, slope, transportation, obstacles, and other significant terrain features. Available photographic coverage of the area should be obtained, and updated photographic coverage of accessible areas requested. Updated photographic coverage is used to provide greater detail of the area and to supplement existing maps. In addition to photographic coverage, the terrain team will use information and material from all available sources to update and increase the detail of available terrain products.

TERRAIN ANALYSIS

The function of terrain analysis is to reduce the uncertainties regarding the effects of natural and man-made terrain on military operations. In order to accomplish terrain analysis, the intelligence staff at division and corps receive direct support from theater terrain teams. Each division receives a direct support terrain detachment, which is headed by a terrain technician. Each corps receives one corps topographic company with a terrain analysis element. A small cell of terrain analysts normally locates at and supports the corps tactical operations center (CTOC). The remaining terrain analysts are located in the corps rear, providing general support to the corps. Terrain team personnel are trained specifically for terrain analysis and should be employed directly in the IPB process at all levels.

To effectively use the terrain data developed by the terrain team, intelligence personnel must understand terrain analysis and its applications to IPB. They must determine the terrain information required to support operations at all levels early in the IPB process. The G2 or S2 establishes priorities for the production of terrain intelligence.

The DMA prepares much of the basic data used by the terrain teams. DMA data is prepared in two standard formats: A Planning Terrain Analysis Data Base (PTADB) at a scale of 1:250,000 and a Tactical Terrain Analysis Data Base (TTADB) at a scale of 1:50,000. These scales coincide with the planning and tactical maps used by Army units, and the planning maps used by joint and combined commands.

DMA-produced terrain data bases include terrain factor overlays with information on--

- Vegetation.
- Surface materials (soils).
- Surface drainage.
- Surface configuration (slope).
- Obstacles.
- Transportation (lines of communication (LOC)).
- Ground water (planning data base only).

Additionally, DMA can provide the following products printed on subdued base maps for--

- Cross-country movement (CCM) maps.
- Transportation maps (road and bridge information).

These standard products are issued to terrain teams to support the terrain data needs of commanders, their staffs, and the IPB process. Terrain analysts are trained to develop their own overlays if DMA-produced overlays are not available. In addition to the DMA supplied, or locally produced products, joint intelligence centers at theater level prepare detailed LOC studies on nonstandard maps. These studies also support the IPB process within the specific theater or joint AO.

At echelons below division, where terrain teams are not directly accessible, terrain data and overlay products are not part of the standard intelligence data base. Intelligence and terrain analysis support are provided from the supporting division when a specific mission is given. The brigade or task force S2 staff must be just as familiar with understanding the interaction of terrain analysis in the IPB process as the division G2 staff.

Terrain analysis emphasizes the use of graphics to depict the effects of the terrain on ground and air operations. However, as time is often limited at the lower tactical levels, only a single terrain product

(overlay), the modified combined obstacles overlay (MCOO), is prepared. Effective terrain analysis depends heavily on weather analysis. Although terrain and weather analyses are performed separately, they should always be done concurrently and integrated to produce a comprehensive evaluation of the tactical environment.

Terrain analysis also requires interaction among intelligence, terrain, and WETM personnel. Intelligence personnel identify terrain information requirements. Using DMA TTADB and other sources, the terrain team personnel develop the tailored products needed to satisfy these requirements. As necessary, the terrain analyst, who is trained to identify terrain features from aerial photographs, supplements these overlays with additional and updated detail. The WETM personnel provide the weather products and information required to determine the effects of weather on the terrain. Together, they develop the graphic data base which facilitates threat integration.

The terrain analyst is trained to determine terrain features from aerial photographs. DMA terrain factor overlays which supplement standard topographic maps are used to develop tailored terrain products. Figure 4-5 shows the terrain analysis process.

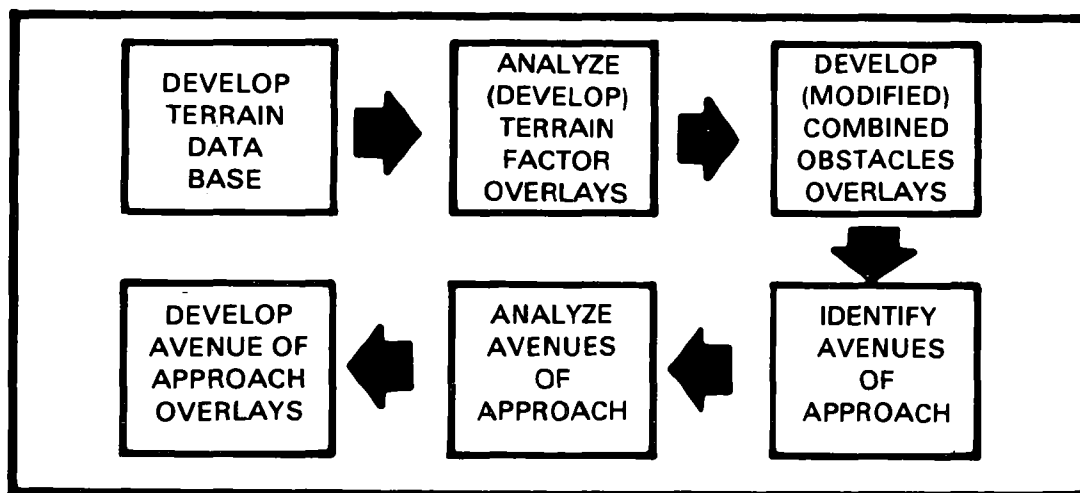


Figure 4-5. Terrain analysis process.

MILITARY ASPECTS OF THE TERRAIN

Terrain analysis focuses on the military aspects of the terrain, known collectively as OCOKA. These aspects include--

- ° O - Observation and fields of fire (FofF).

- ° C - Concealment and cover.
- ° O - Obstacles.
- ° K - Key terrain.
- ° A - Avenues of approach and mobility corridors (air and ground).

Observation involves the influence of terrain on reconnaissance, surveillance, and target acquisition capabilities. In the IPB context, it refers to optical and electronic line of sight (LOS). Battlefield systems including radios, radars, laser range finders, directed energy systems, electronic intercept and direction finders, jammers, and direct fire weapons require LOS to function effectively. Aided and unaided human vision from both ground and air observers also requires LOS. Air defense target acquisition means and weapons require LOS from their positions to the primary air avenues of approach. The anticipated flight altitude of the target relative to the elevation of adjacent terrain must also be considered.

The commander's ability to see the battlefield is influenced by the effects of terrain and weather on these systems. LOS affects aerial systems from the flight route of the aircraft to the forward limits of the AI, while the effects of LOS on ground-based systems is generally limited to the immediate battle area.

Foff involves the effects of terrain on weapons effectiveness. The effectiveness of direct fire weapons is heavily influenced by the terrain within the target area. These weapons require LOS to the target. Through LOS analysis, the analyst determines how terrain affects optic and electronic LOS. LOS overlays graphically portray these effects.

The horizontal visibility or Foff overlay combines the effects of vegetation and slope on LOS. When this information is portrayed graphically, the relative capabilities of direct fire weapons, communications, collection, and target acquisition systems becomes apparent. This overlay assists in identifying key terrain with greater precision. As a minimum, the analyst must have a starting point and elevation to perform LOS analysis. Figure 4-6 shows a sample LOS or Foff overlay.

Concealment and Cover

Concealment is protection from air and ground observation. Cover is protection from the effects of fire. Concealment is vital to operations security (OPSEC) and deception. Both are vital for protection from hostile fire. Concealment and cover are closely related to observation and Foff. The IPB analyst determines the concealment and cover the terrain offers to both friendly and enemy forces. The IPB analyst considers observation and Foff from both air and ground perspectives.

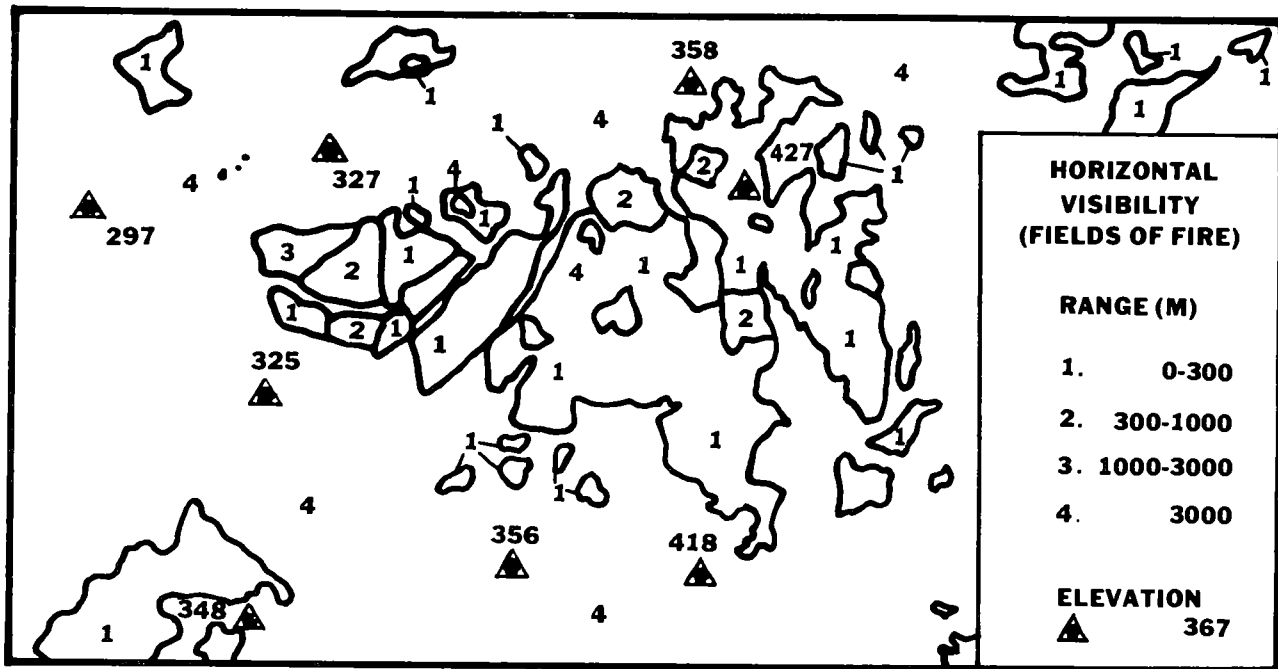


Figure 4-6. Horizontal visibility (FotF).

Friendly and enemy rotary-wing aircraft attempt to use terrain, smoke, and obscurants to conceal their activities from ground observation. These attempts include loitering on the reverse slopes of hills and using vegetation as a backdrop to enhance the aircraft's camouflage. Reverse slopes also afford helicopters cover from direct fire weapons. High speed, low altitude nap-of-the-earth (NOE) flights enhance helicopter and fixed-wing aircraft survivability by reducing enemy ground force and air defense weapons reaction times. Lower-speed helicopters at contour and NOE flight altitudes use terrain masking to an even greater extent to mask aircraft movement in the vicinity of heavy air defense concentrations.

Concealment is critical in the rear battle environment. Vulnerable rear area command, control, and communications (C³) facilities and support units must be protected from enemy air and ground observation. The concealment available to airborne, air assault, guerilla, terrorist, and special purpose and agent forces which can operate in the rear area is also of prime consideration. Concealment is also a prime concern for rear area security, CI, and deception operations. Cover can be considered in terms of protection from enemy long-range weapons systems, its effect on the enemy security mission, and the protection it offers to enemy forces operating in the rear area.

Canopy closure offers concealment from aerial or elevated terrain observation. Summer or wet season and winter or dry season canopy closure overlays compare the canopy growth at the maximum and minimum stages. Figure 4-7 shows examples of summer and winter canopy closure overlays.

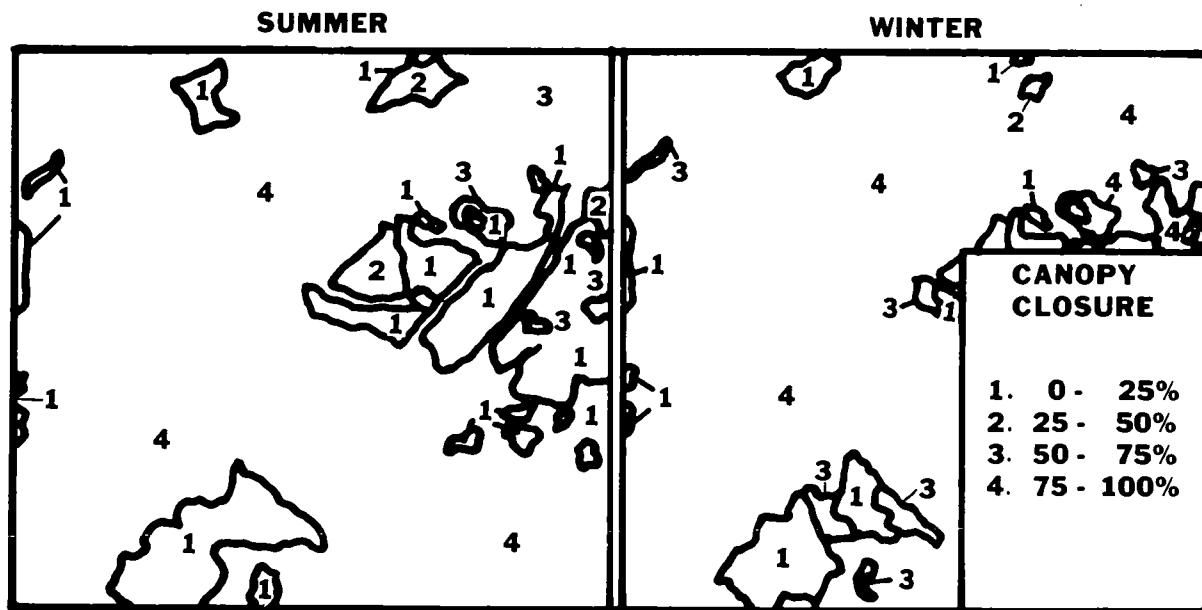


Figure 4-7. Concealment-aerial detection.

Obstacles

Obstacles are natural and synthetic terrain features that stop, impede, or divert military movement. The impact of obstacles on mobility makes them an important consideration during terrain analysis. The analyst must determine where the obstacles to ground and air movement are and what effects removing, overcoming, or bypassing these obstacles will have on overall operations. The analyst must also determine how obstacles affect air defense weapons system and rear area combat support and CSS unit placement. The effects of weather on soil trafficability are also a primary consideration when obstacles are being analyzed.

Key Terrain

Key terrain is any feature or area the seizure or control of which offers a marked tactical advantage. Key terrain is echelon, mission, enemy, and situation dependent. Any terrain that increases or decreases the capability of either the friendly or enemy force to apply combat power may be key terrain. The same is true of terrain which permits or denies maneuver. Some examples of key terrain include--

- ° Bridges.

- Fording sites.
- High ground.
- Choke points.
- Road junctions.
- Survey control points.

Key terrain that has an extraordinary effect on mission accomplishment may be designated as decisive terrain. Mission accomplishment normally depends on the seizure or control of decisive terrain.

During rear COIN operations, potential friendly and insurgent logistic site locations, population, civil-military concerns, security, and PSYOP considerations may determine what is key terrain. Key terrain in these operations may include communications or logistics depot sites, urban areas, areas where the population is sympathetic to the friendly or enemy cause, and refugee evacuation routes.

Air and Ground Avenues of Approach

Air and ground avenues of approach are routes by which a force may reach key terrain or an objective. Avenues of approach are evaluated in the following terms:

- Maneuver support potential.
- Access to key terrain and adjacent avenues of approach.
- Degree of canalization.
- Concealment and cover.
- Observation and FofF.
- Obstacles.

Air and ground mobility corridors are subsets of air and ground avenues of approach. Mobility corridors are areas within the avenue of approach which permit movement and maneuver. They permit friendly and enemy forces to advance or withdraw in doctrinal configuration, and to capitalize on the principles of mass, momentum, shock, and speed.

A ground avenue of approach should be broad enough and contain sufficient mobility corridors to support the rapid movement and maneuver of forces along its entire course. Obstacles should be avoidable or be reduced within a reasonable time without extensive engineer support. Concealment and cover within the avenue are important, particularly to the force that does not have air superiority.

Air avenues of approach and air mobility corridors allow the employment of penetrating aerial sensors, attack aircraft, and airmobile forces. A good air avenue of approach maximizes aircraft survivability and ordnance lethality while capitalizing on speed and shock. The nature of the terrain within the friendly AO determines the air mobility corridors by which attack aircraft must enter and leave the battle area. By analyzing the terrain to determine areas of potential interest to enemy planners, but obscured from them by the terrain, the commander may position air defense assets to deny reconnaissance or effective attack aircraft employment against these areas.

Rear area avenues of approach are analyzed on their ability to support the rapid movement of rear threat elements into the battle area, and their ability to support the rapid forward deployment of friendly rear area elements. Avenues of approach and mobility corridors that allow rapid enemy movement into the friendly rear are also of primary concern. By analyzing these avenues, the rear area commander can rapidly position elements to provide the most effective support while providing the maximum possible protection from potential enemy incursions.

Avenues of approach and mobility corridors are essential to the IPB process. They are the basis for integrating the enemy, weather, and terrain. They delineate the area in which projected enemy activity is likely to occur and dictate the routes an attacking force must take to their initial, subsequent, and final objectives. Depiction of avenues of approach does not stop at the FLOT or line of contact. Avenues of approach are projected through the battle area to known or expected objectives. Figure 4-8 shows the doctrinal depths of Soviet tactical objectives.

The color in which avenues of approach are depicted depends upon the type of operation. During friendly defensive operations, avenues of approach and mobility corridors the enemy would use for the attack would be of prime concern. In such a situation, the avenues of approach and mobility corridors would be depicted in red, prioritized from the most to the least likely, and analyzed based on the largest enemy force they can doctrinally support. During friendly offensive operations the friendly axes of advance become paramount. The axes of advance are depicted in blue, and prioritized from the most to least capable of supporting the attack. Counterattack avenues, corridors, and axes are depicted in either red or blue depending on whether they support enemy or friendly operations.

TERRAIN DATA BASE DEVELOPMENT

Terrain product requirements are compared with the terrain data base to identify information gaps. The primary sources of data base information are terrain analysis data base overlays prepared by the DMA. If these overlays are not available, terrain teams can procure or produce them from available information sources. In addition to standard

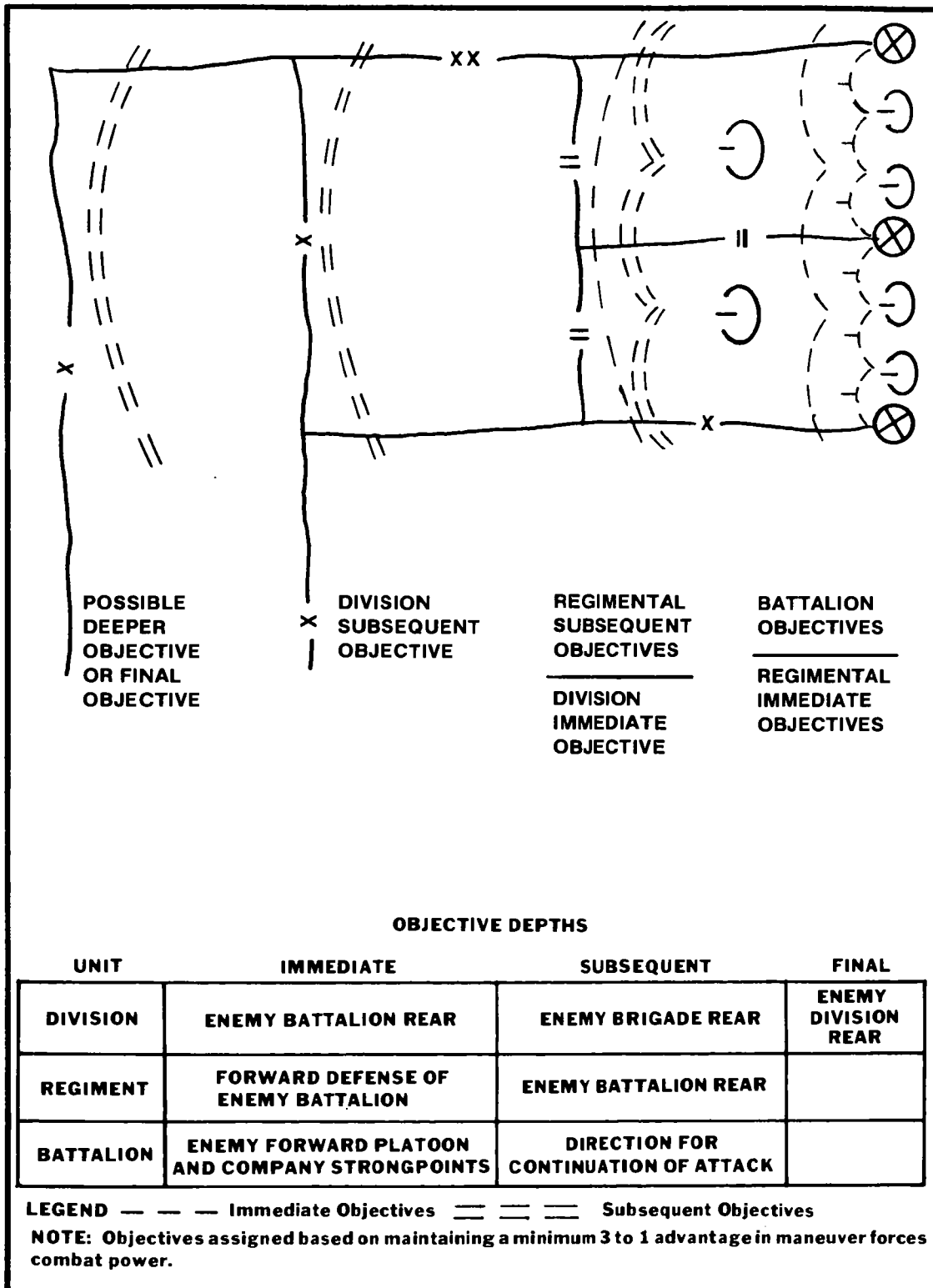


Figure 4-8. Possible hierarchy of tactical objectives for a Soviet division attack against a defending enemy.

topographic maps covering the A0 and A1, the following information sources may be employed:

- The current intelligence estimate and the analysis of the A0 from higher headquarters.
- Special terrain studies and products prepared by US or host-country agencies. These include special maps, charts, and military geographic information reports and digital topographic data.
- Current photography.
- Actual terrain reconnaissance.

Terrain data base development requires considerable time and information. If DMA data bases do not exist, the terrain detachment must have access to imagery and intelligence data. This information may be incomplete and require onsite collection. Terrain detachments are trained to collect--

- Road, railroad, and bridge data.
- Soil and surface configuration data.
- Vegetation data.
- Hydrological data.

TERRAIN FACTOR OVERLAYS

Analysis of the military aspects of the terrain is accomplished primarily through the preparation and analysis of terrain factor overlays. These overlays supplement the information on standard topographic maps. Overlays depicting the following terrain factors not found on military maps can be prepared:

- Tree spacing and tree trunk diameter that impede movement of wheeled and tracked vehicles.
- Stream width, depth, current speed, bank height, and river bed composition for determining crossing points and fording sites.
- Canopy closure and ground vegetation density that provide concealment from observation or cover from fire.
- Soil characteristics that limit mobility.
- The height of vegetation or buildings in urban areas that limit or interfere with horizontal or vertical LOS.

- Synthetic or natural changes to the terrain that have occurred since the available maps were printed (urban sprawl, new highways, rail lines, or forest growth and cutback).
- Slope and other surface conditions that impede cross-country movement.
- Vegetation and surface roughness (micro-relief).

DMA produces terrain overlays that will assist the terrain team in analyzing the terrain. Future automated systems will reduce significantly time required under current manual methods. The terrain team can request these overlays directly from DMA or through the engineer topographic battalion at EAC. Direct requests for DMA overlays should be forwarded to the following address:

HQ, Defense Mapping Agency
 ATTN: PRS
 Building 56, US Naval Observatory
 Washington, DC 20305-3000

Additional overlays may be developed. These may consider factors such as--

- Fording site water depth, current velocity, bank height, and angle and soil composition. Most trucks can ford depths of 2 to 3 feet; most tanks can ford depths of 3 to 4 feet. Current velocity should be less than 5 feet per second. Vertical banks higher than 1 foot will stop trucks; vertical banks higher than 4 feet will stop tanks.
- Embankments, cuts, and ditches which are serious obstacles to mobility.
- Tree height and canopy closure which restrict visibility, and tree density and diameter that impede movement. A forest with trees 6 to 8 inches in diameter will normally stop tanks. A forest with trees 2 inches in diameter will stop trucks. Intervals of less than 20 feet between trees will restrict maneuverability.
- Effects of seasonal precipitation on soils and slopes.

The information required for analysis can be obtained from the engineer topographic team, or from photography and engineer reconnaissance when the area is accessible.

After the individual terrain factor overlays are developed, weather data is integrated. Figures 4-9 through 4-11 show weather factor overlays for built-up areas, LOCs, hydrology, soils slope, and vegetation.

Using the built-up area, LOC, and hydrology overlay (Figure 4-9), an analyst can determine where potential avenues of approach, mobility corridors and main supply routes (MSRs) are located. When the soils or slope overlay (Figure 4-10) is added, the analyst will be able to determine that some potential avenues of approach and mobility corridors are not trafficable. Finally, the analyst combines the vegetation overlay (Figure 4-11) with the other overlays to determine areas where vegetation impedes movement. The vegetation overlay should not imply that movement through these areas is impossible, but that doctrinal rates of movement cannot be met. When the overlays are combined, the analyst is then able to determine the fastest and most direct approach avenues, where mobility corridors and supply routes are located, and where terrain and weather make enemy movement more difficult and therefore less likely.

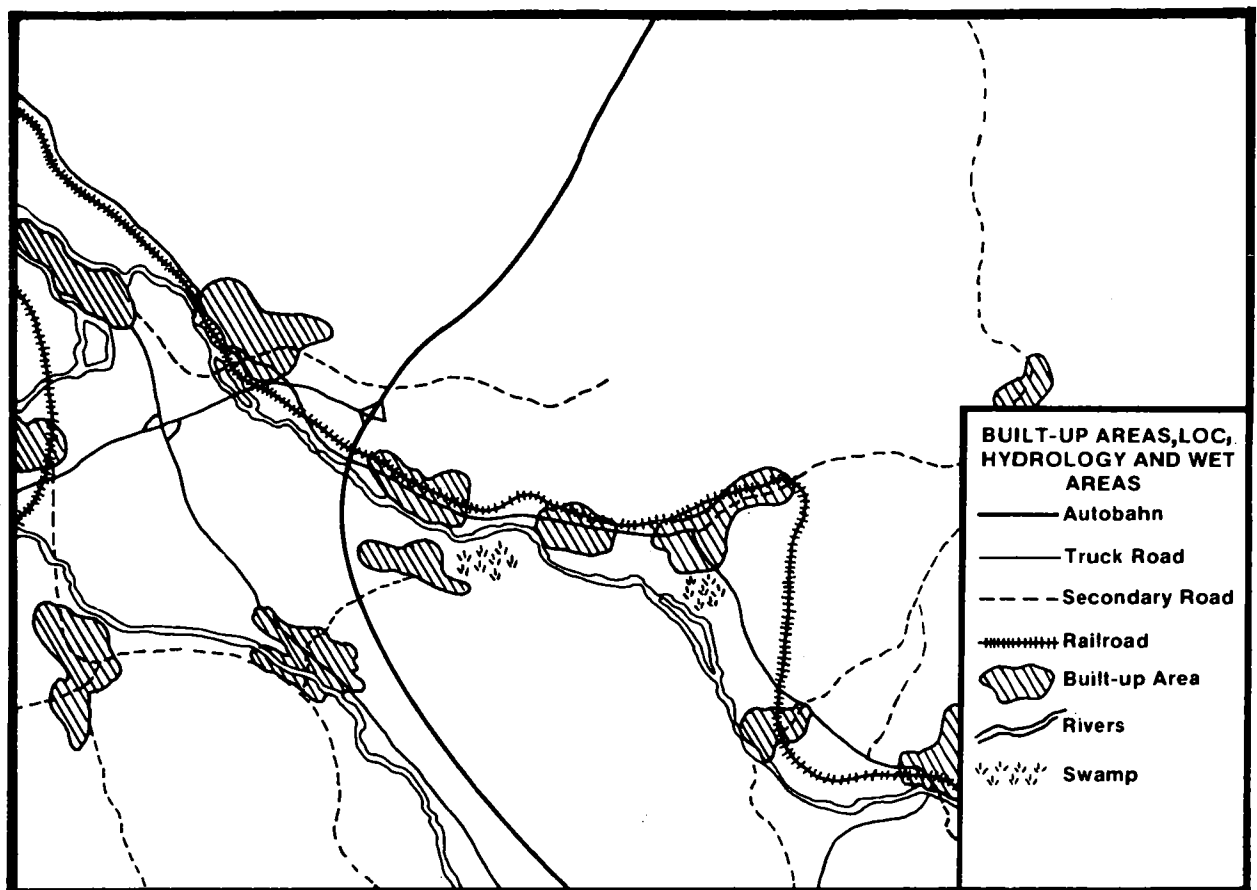


Figure 4-9. Built-up areas, LOC, and hydrology overlay.

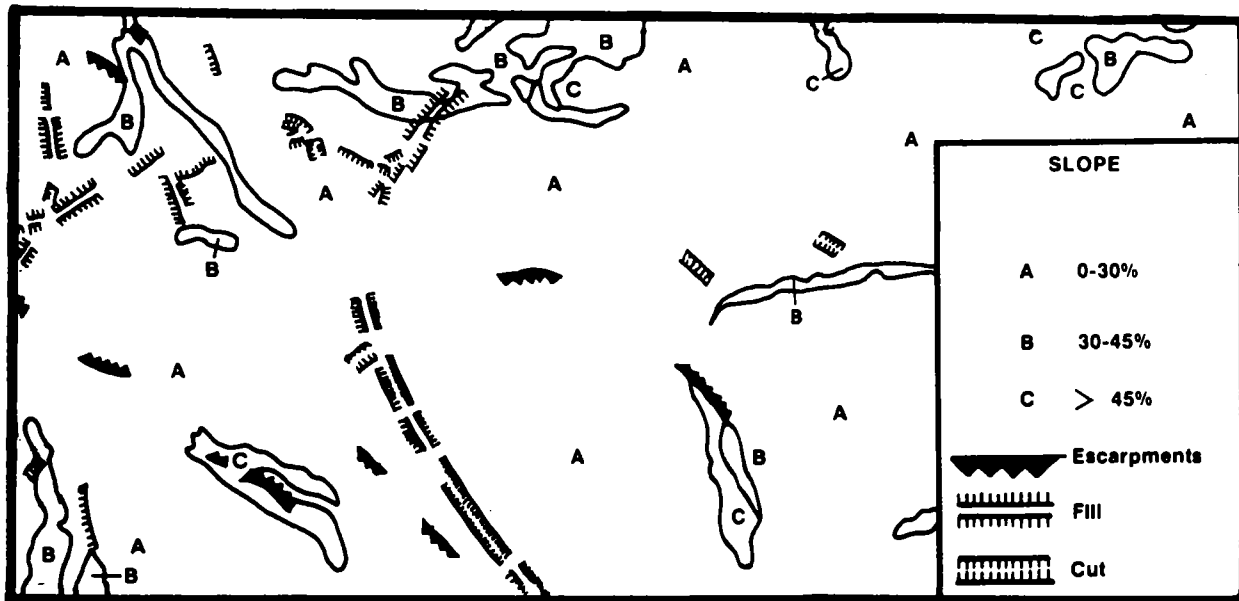


Figure 4-10. Terrain and weather factor combined overlay: Slope



Figure 4-11. Terrain and weather factor combined overlay: Vegetation.

COMBINED OBSTACLE OVERLAY DEVELOPMENT

When terrain factor overlays have been produced, stacked, and registered, the need for the basic information from which the overlays were produced is greatly reduced. Significant terrain features are shown on the overlays and further developed during the analytical process. The combined obstacle overlays incorporate terrain under dry, normal, or wet conditions to depict mobility and cross-country movement rates for use in avenue of approach analysis.

The overlay integrates all obstacles into a single display, greatly simplifying further avenue of approach and mobility corridor analyses. Obstacles are shown as crosshatched areas. Blank areas are those in which maneuver is possible. The WETM and terrain team work together to ensure that the combined obstacle overlay also reflects wet or dry average weather-induced terrain conditions. Figure 4-12 shows an example of a combined obstacles overlay.



Figure 4-12. Combined obstacles overlay.

Obstacles canalize cross-country movement. Excessive precipitation will affect soil trafficability, slope, river depths, widths and bottom conditions, and current speeds and visibility. Cloud cover will prolong the drying period. Normal SLOW-GO terrain conditions may become NO-GO under certain weather conditions, forcing changes in both friendly and enemy operations.

Combined obstacle overlays that reflect normal seasonal weather variations should be prepared. The weather factor analysis matrix is a valuable tool to relate forecast weather conditions to military operations. Staff weather officers (SWOs) and their WETMs use weather factor analysis matrixes to identify which weather elements (parameters) affect planned operations, mission areas, or specific weapons systems. Each of these is affected by different critical threshold values for each weather element identified in the matrix. The weather forecast identifies when and where weather conditions will fall below the critical value. This is the basis for the intelligence analyst to determine how adverse conditions will degrade each phase of planned friendly operations and expected enemy counter operations. Forecasts are used to provide this information during the battle. However, before the battle, there is time to prepare overlays displaying historical average weather conditions (climatology). Using these climatology-based products, the intelligence analyst identifies specific conditional periods, such as--

- Combined obstacles with dry soil.
- Obstacles created by wet soil.
- Combined obstacles with wet soil.

Figures 4-13 through 4-15 show examples of overlays for each conditional period.

The combined obstacles overlay provides a basis for identifying ground avenues of approach and mobility corridors. By determining where enemy and friendly forces can maneuver with the least difficulty, the analyst is able to focus attention on these areas and determine the doctrinal size (frontage and depth) of the unit the avenue or corridor will ideally support.

Avenues of approach normally contain mobility corridors. Both should provide sufficient movement and maneuver space for the size of the force being analyzed. Mobility corridors are subsets of avenues of approach and are normally considered to be areas where a force is canalized or restricted in its ability to maneuver. What is important to remember is that avenues of approach represent a generalized movement route to the objective, while a mobility corridor represents an area where a force must maneuver to avoid obstacles. Under normal circumstances, avenues of approach are analyzed with respect to regimental and larger forces. Mobility corridors are normally considered for regiment and smaller units. The avenues of approach or mobility corridor matrix in Figure 4-16 lists normal requirements for identifying avenues of approach and mobility corridors.

The combined obstacles overlay normally reveals one or more mobility corridors. As enemy regiments usually advance along separate mobility



Figure 4-13. Obstacles with dry soil.

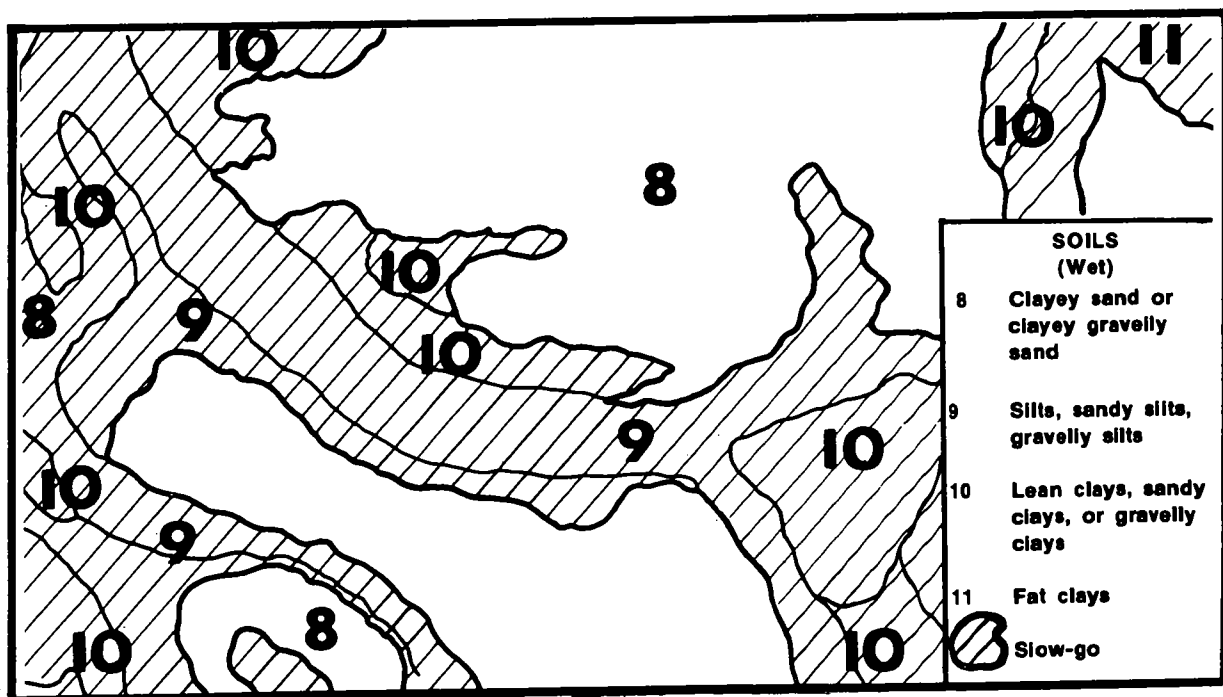


Figure 4-14. Obstacles created by wet soil.



Figure 4-15. Combined obstacles with wet soil.

FRIENDLY ECHELON	AVENUES OF APPROACH	MOBILITY CORRIDORS
CORPS	ARMY/DIVISION	REGIMENT/BRIGADE BATTALION
DIVISION	DIVISION REGIMENT/BRIGADE	REGIMENT/BRIGADE BATTALION COMPANY
BRIGADE	DIVISION REGIMENT/BRIGADE	BATTALION COMPANY

Figure 4-16. Avenues of approach or mobility corridor matrix.

corridors, each divisional avenue of approach should contain regimental mobility corridors. The avenue of approach and mobility corridors begin at the enemy assembly areas, or friendly force line of departure (LD) or line of contact (LC), and extend to the objectives.

Aircraft, like ground forces, employ avenues of approach and mobility corridors. Rotary-wing aircraft, which closely support ground forces, have different requirements than high-performance fixed-wing aircraft. Lower service ceilings and dependence on terrain for concealment allow helicopters' mobility corridors to closely approximate those of ground forces. However, high-performance aircraft are more likely to be employed on avenues of approach that are not necessarily established by terrain.

Air avenues of approach will probably be opened by combined air and ground assaults on enemy air defense radars and weapons and on airfields which support counterair (fighter) aircraft. These attacks come via the most direct available routes. Once aircraft are within the general target area or are threatened by air defense dedicated to defend the specific target, they normally descend to a lower approach altitude to maximize survival. The air avenue to the target depicts the effects of terrain as aircraft avoid exposure to obtain an attack position optimizing the lethality of their ordnance while maximizing aircraft survival. When secure air avenues have been established, high-performance aircraft conduct bombing and air interdiction missions in support of strategic or operational objectives.

The analyst should select alternate and primary avenues of approach and should not be concerned if avenues partially overlap. Remember, the most direct route to the objective is normally the best option.

LINE OF SIGHT ANALYSIS

During terrain and weather analysis, the terrain team has the capability to determine LOS for weapons, communications, target acquisition, intelligence collection, and reconnaissance and surveillance (R&S) systems. Direct fire weapons such as antitank guided missiles (ATGM), self-propelled antiaircraft guns, and tank main guns require good Foff to successfully engage the enemy. Frequency modulation (FM) radio communications, artillery forward observers, forward air controllers, target acquisition and surveillance radars, and EW systems require optical or electronic LOS to the target. LOS analysis helps determine engagement areas, sensor and obscurant vulnerabilities areas, and where the most likely low altitude air avenues of approach are located. Terrain and weather factor overlays assist in analyzing LOS limitations. The following factors are considered during LOS analysis:

- Terrain elevation.
- Tree and vegetation height.

- Height of structures in built-up areas.
- Density of ground vegetation at full growth.
- Subsurface terrain features, such as defiles, which are not apparent because of contour interval.
- Effects of weather, such as fog or precipitation, which will obscure observation.
- Friendly and enemy smoke and obscurants.
- Friendly and enemy sensors.

The effects of seasonal changes on LOS should be readily apparent. Winter vegetation alters LOS significantly from full summer growth. The limitations of the standard military map can be overcome through imagery analysis and ground reconnaissance. Imagery analysts and terrain specialists are trained in LOS analysis.

Direct fire weapons systems require horizontal or ground LOS. LOS analysis should therefore include the preparation of horizontal LOS overlays. Horizontal LOS overlays depict horizontal visibility (FofF) at least out to the maximum effective range of known direct fire weapons. As a minimum, the analyst must have a starting point and elevation to perform LOS analysis. See Figure 4-6 for a horizontal LOS (FofF) overlay.

Terrain masking is the concealment of areas from direct, horizontal, optical, or electronic LOS by terrain features. Terrain masking is especially critical to the placement of ground surveillance and target acquisition radars and the deployment of air defense weapons and radars. Figure 4-17 shows a simplified example of terrain masking.

The maximum range for unaided direct fire weapons is 4,000 meters. The Soviet AT-5 and AT-8 ATGMs have a maximum effective range of 4,000 meters, while the 125MM main gun on the T-64/72/80 tank has a maximum effective range of approximately 2,100 meters. On a smaller scale, the RPK series of the 7.62MM machine gun has a maximum effective range of 800 meters. Requirements submitted to the imagery analysts and terrain team should include the range parameters required for the analysis.

While ground-based systems require horizontal LOS, airborne systems require oblique and vertical LOS. This is particularly true of attack helicopters, which rely on LOS between the aircraft and the target. Aircraft employing standoff weapons systems and pop-up attack techniques require accurate LOS and positioning data. Airborne R&S and intelligence collection systems, such as side-looking airborne radar (SLAR) also require accurate LOS data. Analysis of vertical and oblique LOS from an enemy air defense and target acquisition perspective helps the analyst

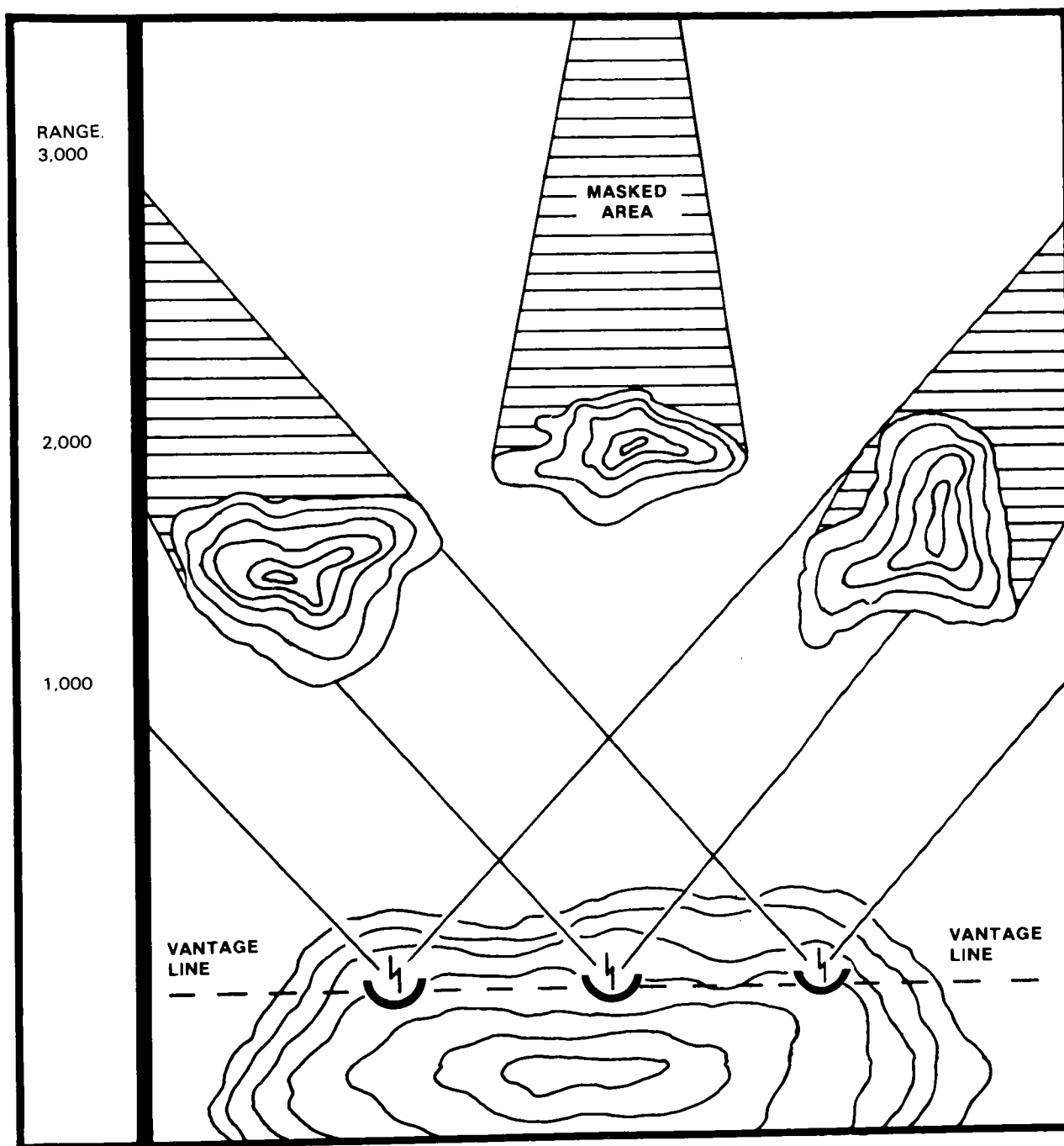


Figure 4-17. Horizontal LOS.

identify the best air avenues of approach and mobility corridors into enemy airspace.

FM radios rely on direct LOS. Their signals can be significantly degraded by terrain masking and severe weather. Terrain will also mask noncommunications emissions such as ground surveillance radar and target acquisition radar signals. Target acquisition radar units normally seek high ground which has an unobstructed view of the battlefield for emplacements. Electronic jammers require electronic LOS to the target being jammed and are also affected by terrain and weather.

Most areas do not offer unlimited options for the employment of communications and noncommunications systems, and of electro-optical systems such as lasers and directed energy. The specific area also affects measurement and signature intelligence (MASINT). With the assistance of signal and IEW personnel, an electronic LOS overlay of potential deployment sites can be prepared. The potential sites are then compared to determine the most favorable. LOS information is also essential to electronic deception operations, as they require a knowledge of where the enemy is likely to have electronic LOS to friendly signals.

The corps or division signal officer can help determine the effects of terrain on both friendly and enemy communications and EW systems. The intelligence and electronic warfare (IEW) officer can also assist in this effort.

AVENUES OF APPROACH ANALYSIS

Avenues of approach analysis is the process by which the avenues of approach that best support friendly and enemy force capabilities are determined. The analysis does not determine which avenue of approach will be used. During defensive operations, it determines which avenues best support enemy capabilities. During friendly offensive operations, the analysis serves as the S2's or G2's recommendation on the best avenues of approach to the objective.

Air avenues of approach are routes which provide aircraft, airborne, or air assault forces a direct route to the target or objective. Again, the analysis determines which avenues best support friendly and enemy capabilities. In spite of the type of operation, air avenues are also analyzed regarding the placement of air defense weapons systems and radars. The best air avenues permit maneuver and provide aircraft with terrain masking from air defense weapons.

The term "air corridor" is used to describe the deployment of (Soviet) fixed-wing aircraft. An air corridor is best described as a path, which is blasted through air defense SAM belts, to enable the aircraft to pass safely through the missile defenses. The air corridor does not extend from the enemy air base to the target as does the air avenue of approach. The air corridor is established through integrated air, ground, and

tactical surface-to-surface missile (SSM) attacks against friendly SAM systems. Aircraft will create air corridors within air avenues of approach whenever possible to enhance survivability. However, not all air avenues of approach will lend themselves to the creation of air corridors.

Specific analysis of air avenues of approach and mobility corridors near potential targets for enemy air is critical. Given the constraints imposed by terrain and visibility, and by the type of target and the potential types of attacking aircraft, it is possible to determine the likely approach to the target. Determining the most likely approach to the target enables the commander to make decisions regarding air defense weapons placement, employment, and tactics.

Once the best air and ground avenues of approach have been selected, overlays are prepared showing each avenue of approach and the mobility corridors within each avenue. Mobility corridors are subsets of the avenues of approach and are depicted concurrently. Although air and ground avenues of approach may be depicted on the same overlay, in most cases, it is better to prepare separate overlays for each type of avenue. If seasonal or weather variations have a significant impact on avenues of approach, separate overlays should be prepared for each season or weather variation.

Figure 4-18 shows an example of a simplified avenue of approach overlay.

THE MODIFIED COMBINED OBSTACLES OVERLAY

The MC00 is the basic product of the battlefield area evaluation, terrain analysis, and weather analysis phases of the IPB process. The MC00 is the graphic terrain analysis on which all other IPB products are based. Although it is basically a graphic terrain analysis, it differs from the combined obstacle overlay in that it presents information that is normally included on the combined obstacle overlay, the avenue of approach overlay, and the friendly operational graphic (friendly boundaries for the AO and AI, objectives, and battle positions). The MC00 also depicts key terrain and known or potential enemy objectives.

The MC00 is one of the two templates or overlays (together with the DST) that is always prepared at all echelons. At higher echelons, where the IPB process is more formal, detailed combined obstacle and avenues of approach overlays produced by terrain analysts may be combined and modified to form the basis of the MC00. At echelons where the IPB process becomes less formal, the MC00 is normally prepared on a single overlay by organic intelligence personnel.

The actual degree of detail depicted on the MC00 depends on the echelon at which it is prepared, and on the time available for its preparation. Normally, an MC00 prepared in support of a battalion or

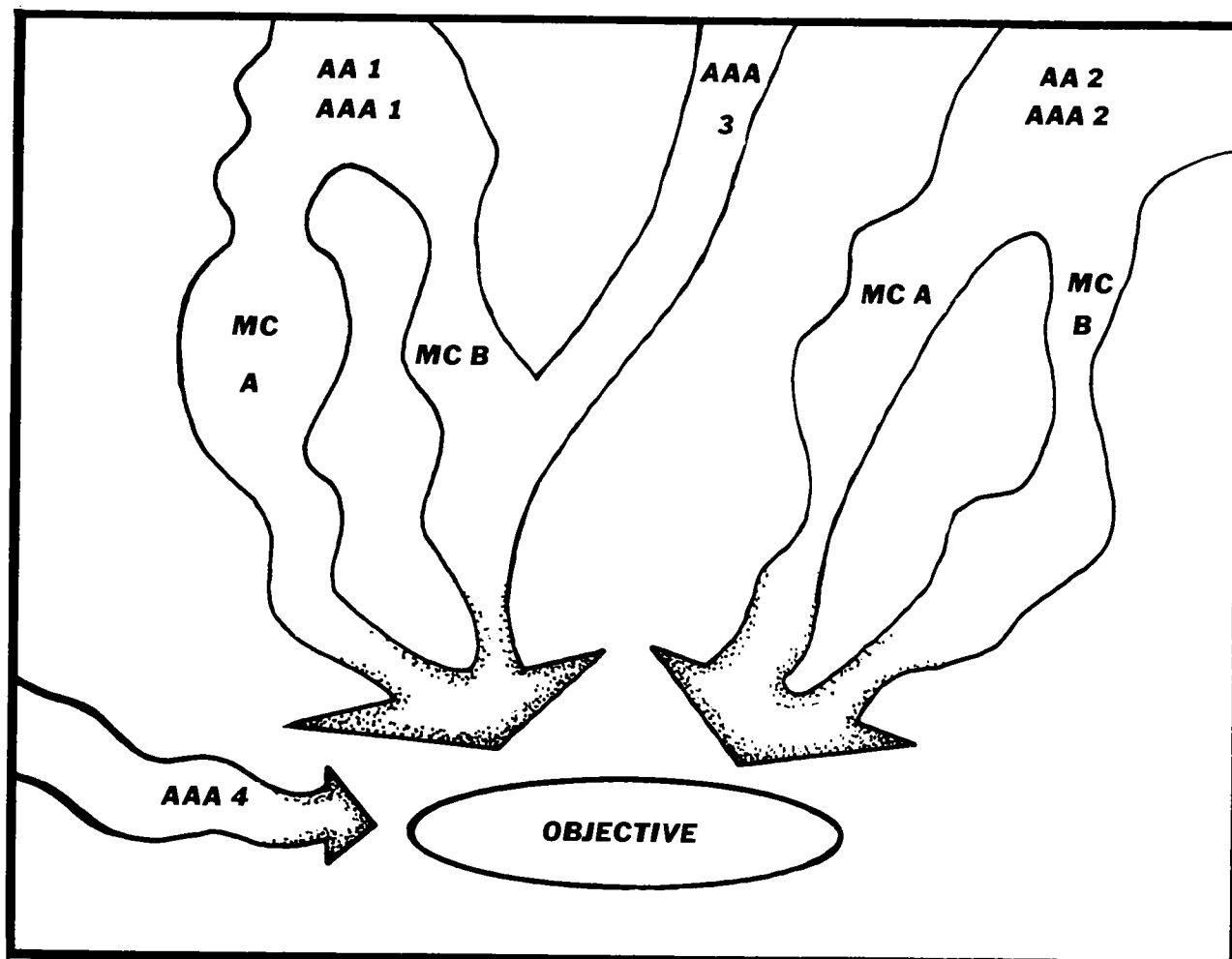


Figure 4-18. Simplified avenues of approach overlay.

battalion task force (BTF) operation will be less detailed than an MCOO prepared in support of higher echelon operations.

Exactly what appears on the MCOO depends on the mission requirements, the type of unit preparing the MCOO and, most importantly, the commander's guidance. However, as with all templates or overlays, the MCOO will contain at a minimum registration marks, classification, titling data, and a legend.

Registration Marks

Also known as tic marks, registration marks are placed in either the upper right and lower left, or the lower right and upper left corners of the overlay or template. They are used to align the overlay and to ensure

correct placement of the overlay on the map if the overlay is removed or is transmitted to another headquarters or unit. All overlays for a particular operation should use the same registration marks, if possible.

Classification

The overall classification of the MCOO is placed at the top and bottom center of the overlay, normally in large black letters. Generally, the MCOO will not be classified higher than SECRET and is never classified higher than the OPORD or contingency plan it supports.

Titling Data

The overlay titling data is used to identify the overlay, the map to which it corresponds, and the individual or headquarters preparing the overlay. The overlay titling data is normally placed in the lower right corner of the overlay or template, and contains--

- Overlay title (the MCOO is titled "MCOO" or "Modified Combined Obstacles Overlay").
- Map sheet name(s).
- Map sheet number(s).
- Map series.
- Map scale.
- "Prepared By" line.

Legend

The overlay legend is normally placed in a separate corner of the overlay from the titling data. The legend contains a description of all symbols used on the MCOO. As a general rule, the legend contains descriptions for:

- NO-GO terrain.
- SLOW-GO terrain.
- Built-up areas.
- Rivers and water obstacles.
- Key terrain.
- Obstacles.

- Avenues of approach and axes of advance.
- Mobility corridors.
- Friendly or enemy objectives.

Additionally, the legend will contain, when required, descriptions used for the symbols to show:

- Contaminated areas.
- Friendly and enemy air avenues and corridors.

While what is shown on the MCOO is based on command requirements, it will normally depict the following:

NO-GO Terrain. Both NO-GO and SLOW-GO terrain are based on the capability of a force to maneuver rather than move through an area. NO-GO terrain does not mean that all movement through an area can be completely stopped. It does mean that maneuver through an area is impractical by the type of force being considered. The road network in a particular area may still support movement, while the terrain itself does not support maneuver. Determination of NO-GO terrain is based on an evaluation of the slope and vegetation in an area and on the type of force that will be maneuvering. What is NO-GO terrain to an armored or mechanized infantry force may not be NO-GO to a light infantry or guerilla force. In fact, such terrain offers a light force the concealment and cover it requires. NO-GO terrain is normally shown by green or brown crosshatching on the overlay. Doctrinally terrain is considered NO-GO when it--

- Will not support maneuver by the type of forces involved (percent of slope in excess of 60 percent, or very heavy vegetation).
- Will support maneuver only through the employment of highly unusual assets, or through a radical or significantly abnormal deviation from doctrine.

SLOW-GO Terrain. Like NO-GO terrain, SLOW-GO terrain is defined by its ability to support maneuver rather than movement and is based on slope, vegetation, and the type of force. SLOW-GO terrain is terrain that can slow or disrupt maneuver. It is depicted on the overlay by green or brown diagonal lines. Terrain is considered SLOW-GO when it permits maneuver--

- At reduced speeds, with or without causing deviations from doctrine (rolling or crosscut terrain, poor or rocky soil composition, or moderate-to-heavy vegetation).
- At relatively normal speeds, but restricts lateral movement or canalizes the maneuvering force (obstacles or canalized valleys).

- With minor-to-significant alterations of doctrinal dispositions, or through the employment of additional but not necessarily unusual assets.

Built-up Areas. Built-up areas larger than 1 square kilometer are considered obstacles. They are outlined and crosshatched in black on the overlay. Analysis of current imagery is critical in determining the actual boundaries of built-up areas, as they are constantly expanding, and because accurate maps rarely exist.

Rivers and Water Obstacles. Rivers and water obstacles such as swamps, lakes, ponds, and canals are outlined in blue on the overlay. Dry lakes that may become obstacles during periods of heavy rains, or which may be artificially flooded, should be included.

Key Terrain. Key terrain is usually designated by a circle with a "K" inside. The symbol is shown in an obvious color other than red or yellow. Purple is recommended for showing key terrain, as the color stands out from the other colors normally used on the MCOO and is easy to distinguish under low light or blackout lights.

Obstacles. Major (cultural) obstacles such as road and rail cuts and embankments, power lines, and overpasses are depicted on the MCOO in black. Battlefield obstacles such as antitank ditches and minefields are also shown in black using the symbols found in FM 101-5-1. All symbols used on the MCOO are shown in the legend.

Avenues of Approach and Axes of Advance. Enemy avenues of approach are indicated on the MCOO in red. Friendly axes of advance are indicated in blue. Avenues of approach indicate the size of the enemy force they will support (for example, division, army, and so forth). They are based on doctrinal frontages, are shown from at least the FLOT to the final objective, and are prioritized to indicate the most likely avenue. As they show the general area through which a force can move, the boundaries of avenues of approach and axes of advance may cross NO-GO terrain.

Mobility Corridors. Mobility corridors are shown either in red (enemy) or blue (friendly) on the MCOO, and indicate areas where a force will be canalized or forced to narrow its frontage due to terrain. They are normally labeled with the size of the force they will doctrinally support, and depending upon requirements, may be prioritized to indicate the most and least likely. The boundaries of mobility corridors normally do not cross NO-GO terrain.

Friendly or Enemy Objectives. Friendly or enemy objectives are shown on the MCOO in either blue or red. They may be shown either as area objectives or limits of advance, as shown in FM 101-5-1.

Figure 4-19 shows a simplified version of an MCOO.

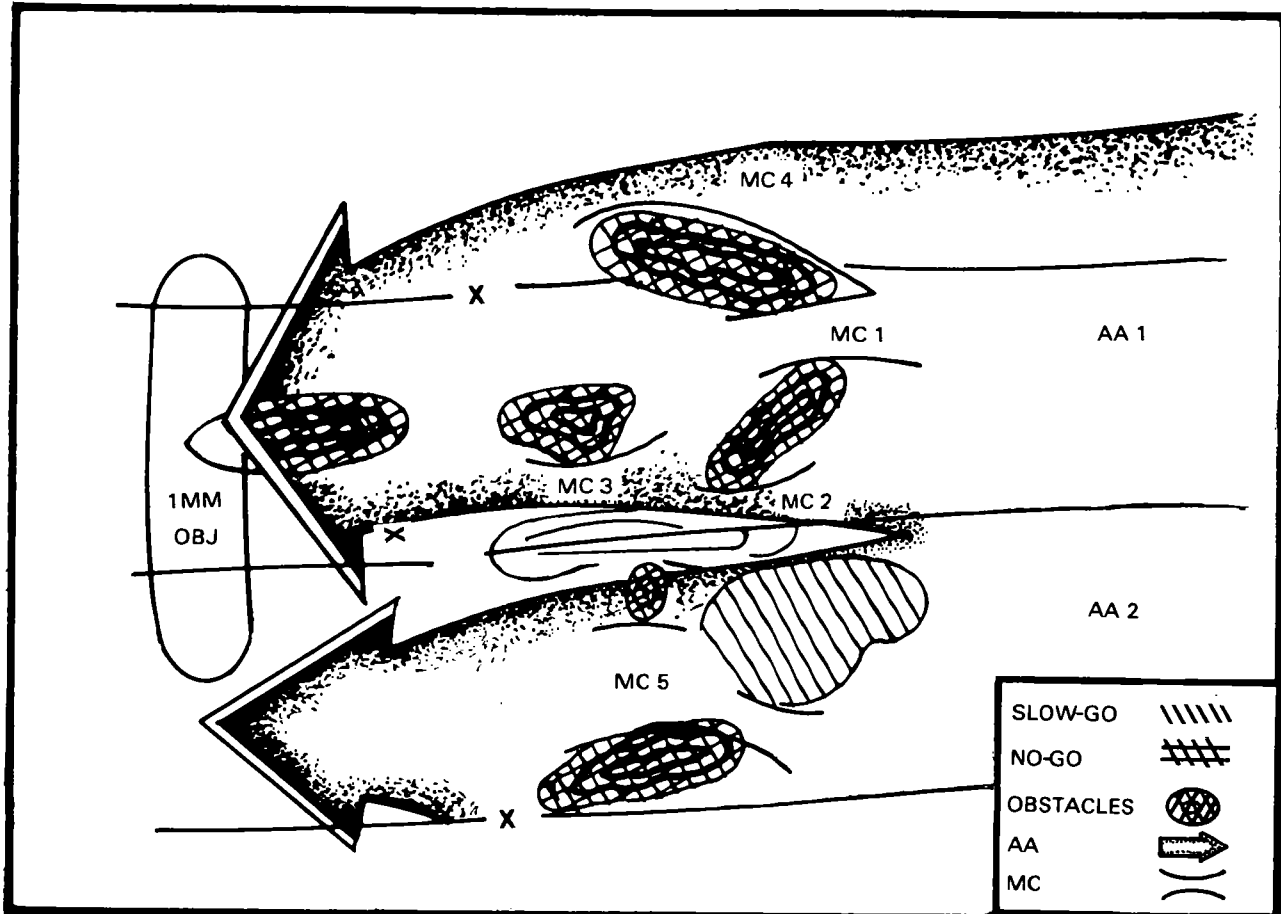


Figure 4-19. MCOO.

WEATHER ANALYSIS

The weather in the AO and AI are analyzed to determine its effects on friendly and enemy operations. For a complete description of weather effects, see FM 34-81. Terrain and weather analyses are inseparable, because the tactical environment requires that weather and terrain information be considered simultaneously and developed as an integrated product. The integrated weather and terrain information is then applied to enemy doctrine during threat integration to produce situation templates.

The weather has a significant impact on both friendly and enemy operations. It affects each force's ability to move, shoot, and communicate. To consider the weather, the commander integrates terrain and weather information to determine potential maneuver areas.

The USAF WETM is responsible for providing weather information for the AO and AI. The terrain team analyzes the effect of terrain and weather interactions on tactical operations. Together, they integrate weather and terrain data and overlays. Figure 4-20 shows the weather analysis process.



Figure 4-20. Weather analysis process.

MILITARY ASPECTS OF WEATHER

Commanders must ensure their staffs understand and consider weather factors in their tactical planning. They must recognize the tactical significance of weather and its potential impacts on operations.

Low visibility (less than 3 kilometers) is beneficial to offensive and retrograde operations and is detrimental to defensive operations. It conceals the concentration and maneuver of offensive forces, enhancing the possibility of achieving surprise. Likewise, it hinders the achievement of cohesion and control and reduces the effectiveness of R&S and target acquisition during the defense. These disadvantages can be partially offset by extensive use of illuminants, radar, infrared devices, and sound detection. During periods when reduced visibility is desirable, smoke and other obscurants can be used to locally reduce visibility. In all cases, reduced or restricted visibility may prevent or limit the employment of aircraft, aerial sensors, and airborne forces. Agent and special operations forces (SOF) insertion operations rely heavily on reduced visibility and darkness to conceal their operations and to reduce the effectiveness of rear area security.

Wind speed and direction, both at the surface and aloft, normally favor the upwind force; they also affect the employment of NBC and conventional weapons. Strong winds reduce the effectiveness of the downwind force by blowing dust, smoke, sand, rain, or snow on personnel and equipment. The upwind force generally has better visibility and can advance faster and easier. Dust plumes created by moving vehicles are less pronounced for the upwind force. Strong winds limit airborne operations and hinder aviation (especially rotary-wing aviation) operations.

Winds in excess of 35 knots can cause personal injury during air assault operations; damage material and structures; create false radar returns; and reduce visibility by blowing sand, dust, and other battlefield debris. Depending upon conditions, smoke operations are generally ineffective when wind speeds are greater than 10 knots. At temperatures below 40°F, winds make windchill a critical consideration. Whether created naturally or by vehicle movement, the windchill factor adversely affects improperly clothed personnel. Wind also affects the distance that sound travels. Finally, wind can improve trafficability by causing soil to dry faster.

Precipitation is significant because it affects trafficability, visibility, personnel effectiveness, and equipment. Heavy rains can make some unsurfaced roads, low-lying roads, and off-road areas impassable. Even areas which are stable during dry weather can become quagmires when rains are combined with high levels of operational traffic. Both rain and snow can drastically reduce personnel effectiveness by limiting visibility, causing discomfort, increasing fatigue, and creating other physical and psychological problems.

Rain and snow can combine with persistent chemical agents or nuclear contamination to produce NBC hot spots in low-lying areas. Light rains distribute persistent agents more evenly, exposing more liquid to the air and increasing evaporation, which causes higher vapor concentrations. Precipitation also increases hydrolysis. Heavy or extended rains tend to wash chemical agents into previously uncontaminated areas such as depressions or steambeds. Precipitation degrades the quality of some stored materials. Snow accumulations of little as 0.5 inch can start to degrade trafficability. Greater amounts reduce the effectiveness of antitank and antipersonnel mines. Precipitation rates of more than 0.5 inch (12.7mm) per hour, or 2.0 inches (51mm) in 12 hours, are critical to tactical operations. Snowfall which exceeds 2 inches in 12 hours, 6 inches (152mm) of snow accumulation, or snow drifts of 2 feet (.6m) or higher, can have a significant adverse effect on mobility.

The type and amount of cloud cover and the altitude of cloud bases and tops influence aviation operations. Clouds are often associated with unstable air, strong vertical air currents, turbulence, and restricted visibility aloft. This becomes more pronounced as the cloud cover increases, as cloud bases lower, and as conditions frequently associated with clouds, such as icing, increase. Generally, close air support (CAS) employing fixed-wing aircraft requires a ceiling of at least 2,500 feet (762m), but can be employed with ceilings as low as 500 feet or 1,000 feet in flat terrain. CAS by threat rotary-wing aircraft and threat and friendly aerial resupply missions requires a minimum ceiling of 300 feet (100m). Friendly rotary-wing aircraft are able to fly lower to avoid cloud cover. Normally, however, at least one-fourth mile of visibility is required.

Cloud cover affects ground operations by reducing illumination and visibility, or by unnaturally enhancing the effects of artificial

illuminants. Clouds also determine the type, intensity, and amount of precipitation. Clouds trap heat from the sun and heat rising from the earth, raising temperatures at or near ground level. Cloud cover of more than 70 percent creates neutral gradient conditions which favor the employment of smoke or chemical agents. Conversely, cloudless skies allow heat to escape quickly at night, causing very cold conditions for troops in the field.

Temperature and humidity have a direct impact on personnel and vehicle performance. Excessively high temperatures cause heat-related injuries to personnel (especially those in mission-oriented protection posture (MOPP) gear) and increase vehicle engine wear and thus failure. Excessively low temperatures increase the likelihood of cold weather injuries, cause damage to vehicle cooling systems and engines, decrease the effectiveness of vehicle lubrication, and create excessive logistics requirements. Colder temperatures coupled with high humidity produce fog, especially in low-lying areas. Temperatures near -20°F and high humidity can create an ice fog, which can coat roads and vehicles with ice within a short time. This can force frequent moves by artillery batteries, decreasing rates of fire.

Temperature and humidity affect air density. Air density decreases as temperature increases. High temperature and humidity reduce the efficiency of aircraft propulsion and aircraft lift capabilities. Although temperature and humidity may not have a direct effect on a particular tactical operation, extremely high temperature and humidity will reduce aircraft payloads.

Temperature has a direct impact on the potential for civil disorder in an area. Colder temperatures keep people inside and inactive, reducing the potential for civil strife. High temperatures often have an irritating effect on the population, increasing the potential for civil strife. Therefore, groups or individuals seeking to create civil disturbances normally will attempt to do so during hot weather.

Tactics which are effective in one climate may be ineffective in another. The high temperatures and humidity of the tropics are conducive to the growth of dense foliage, which drastically affects mobility and visibility. Conversely, the extreme cold of the arctic--

- Creates an almost constant requirement for heated shelters.
- Causes difficulty in constructing fortifications.
- Increases dependence on logistic support.
- Creates the need for special clothing, equipment, and combat skills.
- Reduces the dependability of high frequency (HF) radio communications.

The combination of low temperature and wind speed creates a windchill factor. A windchill factor of -26°F (-32°C) is considered critical for personnel and equipment operations. At the opposite extreme, 120°F (49°C) is also considered critical for personnel and equipment operations. Commanders should be aware that maximum and minimum temperatures (day and night) can vary as much as 50°F in desert areas. Sun glare in desert environments can cause night blindness to unprotected eyes. Therefore, soldiers must be provided with sunglasses.

WEATHER DATA BASE DEVELOPMENT

The basis for weather analysis depends on the timeframe for which the analysis must be made. Preparation for a contingency situation or the first battle of a campaign may take place weeks or months in advance. The weather data base will generally be drawn from historical records (climatology) for the AO. Once the unit is engaged on the battlefield, evaluation of the current weather situation is based on the weather that is actually occurring within the AO or AI. In planning for the next battle, the weather forecast for the next 3 to 5 days (for corps and EAC), and the next 1 to 2 days (for division and below) is used to complete the weather analysis portion of the IPB process.

Climatology-based analysis for upcoming operations should be completed as early as possible during the planning stages. It is critical that the operations and intelligence staffs bring the SWO into the planning cycle as early as possible to allow for the proper development of weather products. The G2 must provide the SWO with the AO and AI, the particular time of year for which the weather products are required, the critical threshold values for each weather element (parameter) at each supported echelon, the map scale for which overlays are to be developed, and other specific details required for weather analysis.

The SWO uses a weather factor analysis matrix to help identify which weather elements affect the unit's mission, tactics, equipment, and personnel. From this matrix, the SWO determines the weather elements for which critical threshold values must be established. For example, airborne units can safely conduct paradrop operations only when surface wind speeds do not exceed 13 knots. Thus, 13 knots is the critical threshold value for airborne operations. The SWO, together with the G2 or S2 and G3 or S3 can determine the critical value for each weather element identified in the weather factor matrix. Certain weather elements may have several critical values. For example, the following wind speeds are considered to be critical:

- 7 knots for NBC operations.
- 13 knots for airborne operations.
- 30 knots for airmobile operations.

Once the critical values have been determined, the SWO can determine the overlays needed from the USAF Environmental Technical Applications Center (USAFETAC), the DOD Climatological Data Agency. USAFETAC may be tasked to produce climatology-based overlays for planning purposes. The organic USAF WETM will prepare overlays in the field to support actual operations. This method ensures that the overlays are tailored to the unit's AO or AI, mission, tactics, and equipment, and that they are produced to a standardized map series and scale.

The weather products received from USAFETAC are used by the SWO and terrain analysis personnel to create integrated terrain and weather products. Some examples of weather overlays employed in the IPB process include--

- ° Visibility less than 1,000 meters.
- ° Snow depth greater than 6 inches.
- ° Cloud ceiling less than 300 meters above ground level (AGL).

The weather analysis process is shortened when observed weather, rather than climatology, is used for the weather data base. Using the completed weather factor analysis matrix, and the relevant critical threshold values, the SWO uses the latest observed weather data from all available sources to develop weather overlays. Sources of this information may include deployed USAF WETMs, observations made through the Army forward area limited observation program (FALOP), pilot reports (PIREPs), artillery limited surface observations (ALSO), target weather intelligence (TARWI), and satellite imagery.

Rapid receipt of these observations will enable the SWO to make an on-the-spot evaluation of the weather effects on battlefield operations and to develop overlays based on established critical values. These overlays are based on the same weather elements as those developed from climatology and are used to show areas where present conditions differ from the long-term average. They present the current weather situation and indicate where major and minor conditions differ from the long-term average. They present the current weather situation and indicate where major and minor deviations from weather norms are occurring. Once developed, the SWO uses these overlays as a starting point to prepare forecast weather overlays which predict the most likely weather effects on operations as the battle progresses.

Weather analysis is most effective when forecast products are used to develop the weather data base. Corps planners normally require 72-hour forecasts to develop plans and to conduct operations. Divisions normally require 48-hour forecasts while separate brigades and armored cavalry regiments (ACRs) generally require 12- to 24-hour forecasts. The forecast weather data base used to provide planners with this information is developed by the SWO and the weather forecasters of the WETM.

In order to make 3- to 5-day forecasts with the degree of accuracy required by Army decisionmakers, several things must occur:

- Weather observations from all available sources must be transmitted to SWOs at all echelons, to EAC, and to the central weather facilities. The central weather facilities prepare a complete description of the surface weather for a specific time and use this data, together with artillery meteorological upper-air observations, to develop a computer model. This numerical model produces worldwide data fields with numerous weather values.
- The data fields are annotated on charts which are then transmitted through Army communications channels to the deployed WETMs.
- USAF WETMs use these data fields to produce the forecasts required to complete the weather analysis process.

Due to the complexity of the models used in the development of the forecast weather data fields, the processing required must be completed at a permanent central weather facility either at EAC or in the continental United States (CONUS).

The essential key to weather data base development is the inclusion of the SWO in operational planning, specifically giving the SWO detailed knowledge of the mission, tactics, and systems of the supported unit. Through staff coordination, the SWO--

- Determines which battlefield systems and operations are degraded by the weather.
- Assists in identifying the critical weather threshold values for specific operations as identified by the Army users.
- Ensures that the proper weather overlays are produced.

Weather products employed in IPB may include weather briefings, written messages, or overlay addendums or annotations as well as overlays themselves. The SWO must be prepared to react to the tempo of battle and, as such, cannot always take the time to prepare detailed overlays. Therefore, intelligence personnel must be prepared to integrate available weather information with existing intelligence on the enemy and terrain based on verbal or written presentations. Again, the key to presenting this information is for the staff or product user to specify critical weather threshold values for their equipment and operations. The SWO then evaluates how the forecast weather conditions limit operations by exceeding or falling below the known critical threshold values.

Weather data base development is limited by the amount of information available to the SWO and the WETM. Without sufficient current weather

information, the WETM is normally unable to produce overlays of the same quality as those based on climatology. The commander must be aware of this limitation and ensure that the WETM has continuous communications in order to maintain the maximum forecasting capabilities. When the battlefield situation limits the WETM's forecasting capabilities, the SWO must keep the commander, G2, and the staff users informed of the confidence level of both the weather forecasts and the weather products produced.

Weather Factor Analysis Matrix Development

The weather factor analysis matrix is a useful tool to show the use and application of weather forecasts in support of tactical operations. Figure 4-21 is an example of a weather factor analysis matrix. Each WETM will tailor the matrix to support its particular unit, mission, weapons, and tactics. Each weather factor which has an impact on the mission at that echelon is assigned a critical threshold value. When weather conditions exceed or fall below the critical value, normal tactical operations can no longer be conducted. Although the supported unit is responsible for the actual determination of the critical threshold values, the SWO can assist by providing information from other units of the same echelon when available. When critical values have been established for contingency operations, the SWO annually revalidates the values with the user to ensure that they reflect current unit equipment and operational considerations. Given the critical values, the SWO establishes the baseline value for each required overlay. USAFETAC then uses the baseline values supplied by the SWO to prepare overlays for planning purposes. In the same way, the USAF WETM prepares overlays to support current battlefield operations. Both products clearly show the areas where critical threshold values are considered favorable, marginal, or unfavorable for planned operations.

When used with a forecast data base, the critical threshold values form the basis for the SWO's weather forecast matrix. The weather forecast predicts the weather for a given time and highlights the effects of weather on operations. The weather forecast matrix uses either shading or color coding (green = favorable, yellow = marginal, and red = unfavorable) to show the predicted time that each forecast weather element exceeds or falls below its critical value. The matrix is normally presented to the commander either as a briefing slide or as a printed chart. Figure 4-22 shows a weather forecast matrix. The blocks should be colored red, yellow, or green to highlight where the forecast conditions passed through the critical threshold values which identify unfavorable, marginal, or favorable weather effects in each mission area.

WEATHER FACTOR OVERLAY DEVELOPMENT

Weather factor overlays are normally shaded red or crosshatched to show areas where critical weather values are exceeded, and shaded yellow

MISSION AREA OR USE	FAVORABLE	MARGINAL	UNFAVORABLE
Airborne/(DZ) Static Line	CIG/VIS > 500 and 3 SFC Wind ≤ 13 knots Wind at Alt ≤ 30 knots	CIG/VIS ≤ 500 and 2 but ≥ 500 and 1	CIG/VIS < 300 and 1 SFC Wind > 13 knots Wind at Alt > 30 knots
RAM Air Canopy MFF/HALO	SFC Wind ≤ 18 knots Wind at Alt ≤ 30 knots		SFC Wind > 7 knots Wind at Alt ≥ 30 knots but mission dependent
Airmobile (Landing Zone)	CIG/VIS ≥ 300 and 1-1/2 miles No icing or turbulence SFC winds at ≤ 20 knots	CIG/VIS ≤ 300 and 1-1/2 miles but ≥ 200 and 1/2 mile Light icing and turbulence SFC Wind > 20 knots but < 30 knots	CIG/VIS < 200 and 1/2 mile Moderate icing and turbulence SFC Wind > 30 knots
Night Vision Goggles (PVS-5) and starlight scope	Sky clear moon $>$ one quarter Elevation $> 30^\circ$	SCT clouds New moon to one quarter	Overcast clouds or new moon
MC-130 Operations to penetration landing	CIG/VIS > 1000 and 2 miles	CIG/VIS < 1000 and 2 miles but > 500 and 1 mile	CIG/VIS < 500 and 1 mile
MOPP IV wear	Temp $\leq 70^\circ$ F RH 50%	Temp 70 to 85°F RH 50 to 70%	Temp $> 85^\circ$ F or RH $> 70\%$
PSYOP Leaflet drop Loudspeaker NBC Smoke operations	SFC wind ≤ 10 knots SFC wind < 20 knots Temp Inversion aloft Winds toward threat force SFC wind < 5 knots	SFC Wind 10 to 20 knots SFC Wind 20 to 35 knots No Inversion Wind light/variable Neutral lapse rate Wind 3 to 7 knots	SFC Wind > 20 knots SFC Wind > 35 knots Inversion aloft with wind toward friendly force SFC winds > 7 knots
Weapon sighting	VIS > 1000 meters	VIS < 1000 but > 500 meters	VIS < 500 meters
Ground reconnaissance	VIS > 3200 meters	VIS < 3200 but > 1000 meters	VIS < 1000 meters
Key: $\geq$ Greater than or equal to. $>$ Greater than. $\leq$ Less than or equal to. $<$ Less than. CIG - Ceiling or height above ground level to base of clouds. VIS - Optical visibility in miles or meters. SFC wind - Wind speed at the surface from any direction. Temp - Temperature in degrees Fahrenheit or Celsius. Inversion - A layer of air above the ground where temperature rises rather than con- tinuing to cool as height increases. RH - Relative Humidity			

Figure 4-21. Weather factor analysis matrix.

Time of Forecast																	Date/Time /			
Mission Area or use	FORECAST TIME PERIOD																			
	24 Hours				48 Hours				72 Hours				96 Hours							
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96				
Airborne/(DZ) Static Line																				
RAM Air Canopy MFF/HALO																				
Airmobile (Landing Lanes)																				
Night Vision Goggles PV5-5 and Starlight Scope																				
MC-130 Operations to Penetration Landing																				
PSYOP																				
NBC																				
Weapons Sighting																				
Ground Reconnaissance																				
Trafficability																				
KEY: FAVORABLE (No Shading—Green) MARGINAL (///// —Yellow) UNFAVORABLE (///// —Red)																				

Figure 4-22. Weather forecast matrix.

or diagonally hatched to reflect marginal weather areas. Overlays are keyed to the map employed to support operations at the particular echelon. The use of standard 1:50,000 scale maps often creates a problem during overlay development, as the SWO or WETM normally does not have sufficiently detailed information to provide more than a single forecast value for the entire map sheet. In such a case, the WETM will normally display a number of weather elements on a single overlay in order to achieve the most accurate possible portrayal.

Because different systems have different critical threshold values, it is often necessary to employ multiple color shades on the overlay to depict individual system limitations. For example, HELLFIRE ATGMs, COPPERHEAD, and rotary-wing aircraft all have different minimum cloud ceiling requirements. To accurately depict the critical value for each weapons system requires shading on the cloud cover or cloud ceiling overlay. When used, the color shades which depict the restrictions for each system will be defined in the overlay legend.

Combat support operations are often overlooked when developing weather factor overlays because the major weather support effort is normally directed toward close and deep operations. However, rear and CSS commanders require weather overlays which reflect the critical weather values for their particular areas of concern. For example, CSS commanders are concerned with icing conditions, snow accumulations, and precipitation on rates which affect movement capabilities and unit or facility placement. Rear operations commanders at all levels require detailed overlays which reflect critical weather values for visibility (aviation, air defense, agent, and guerilla or insurgent operations), cloud cover (aviation and air defense operations), and precipitation (NBC, logistics, and movement support operations).

THREAT EVALUATION AND DOCTRINAL TEMPLATING

Threat evaluation is a detailed study of enemy forces, their composition and organization, tactical doctrine, weapons and equipment, and supporting systems. Threat evaluation determines enemy capabilities and limitations and how the enemy would fight if not constrained by weather and terrain.

Enemy forces are evaluated to determine their capability to operate effectively within the specific battlefield environment. For example, is enemy equipment suitable for operation under weather and terrain conditions in the battle area? Does the enemy have the capability to employ NBC weapons, and to operate in an NBC environment? Factors such as these are thoroughly evaluated to determine the enemy's capabilities and vulnerabilities.

Threat evaluation includes an examination of the threat's critical C² nodes, HVTs, and doctrinal rates of movement. Movement rates and HVTs will be reevaluated during the threat integration phase of IPB to determine the constraints imposed by terrain and weather.

Threat evaluation includes the evaluation of the airspace, LIC, and rear operations threat, and is a continuing process. Enemy capabilities, organizations, and tactics are dynamic. Threat doctrine changes as new combat capabilities are developed. We must be sensitive to these changes as they occur, and continuously update the threat data base with the most current information available.

Doctrinal templates are the primary products of threat evaluation. Doctrinal templates convert enemy OB data into graphic format. These graphics depict how the enemy might deploy their forces according to doctrine and training without the constraints of weather and terrain. They depict various enemy echelons and unit types for various operations and schemes of maneuver. Figure 4-23 shows the uses of doctrinal templates and their relation to situation and target development.

TEMPLATE USES	SITUATION DEVELOPMENT	TARGET DEVELOPMENT
Depict enemy doctrine for force composition, frontages, depths, personnel and equipment strengths, and ratios.	Provide basis for situation development. Situations serve as the basis for the integration of doctrine with weather and terrain.	Initial HVT categories identified by the analyst.

Figure 4-23. Uses of doctrinal templates.

Except for large airborne, air assault, or bombing operations, doctrinal templates for air operations are not meaningful. The employment of small formations of fixed and rotary-wing aircraft cannot be templated due to the airspace medium and the high degree of aircraft maneuverability. Instead, friendly air defense and counterair forces should be made aware of probable air avenues of approach and mobility corridors and the effects of these corridors on aircraft attack altitude, individual attack profiles, and maneuverability. They should also be advised of the masking effects of the terrain on air defense target acquisition systems and weapons. Doctrinal templates for the ground phase of larger airborne and air assault operations are prepared to reflect the doctrinal composition, frontages, depths, and equipment of these forces.

Rear area threat evaluation will result in a limited doctrinal template which focuses on the enemy's air assault, airborne, operational maneuver group (OMG), and special purpose force employment doctrine.

It is not possible to prepare doctrinal templates depicting other rear area threats such as insurgents, guerillas, terrorists, agents, and potential civil unrest. For these potential threats, doctrinal templates are replaced by the unconventional warfare situation map (SITMAP) and the population status overlay (Appendix E).

The rear area unconventional warfare SITMAP includes probable insurgent operating areas, headquarters, encampments, and movement routes. The SITMAP will include similar information for terrorist groups, agents, and small KGB/GRU special purpose (SPETSNAZ) detachment operations. The rear area population status overlay depicts areas where a high potential for civil unrest exists, or where groups or concentrations of individuals known to be sympathetic to the enemy cause are located. The overlay also indicates where PSYOP would be most and least effective, and is prepared only after a thorough study of the military-political, social and economic climate within the area.

THE THREAT EVALUATION PROCESS

Figure 4-24 shows threat evaluation as a multistep process.

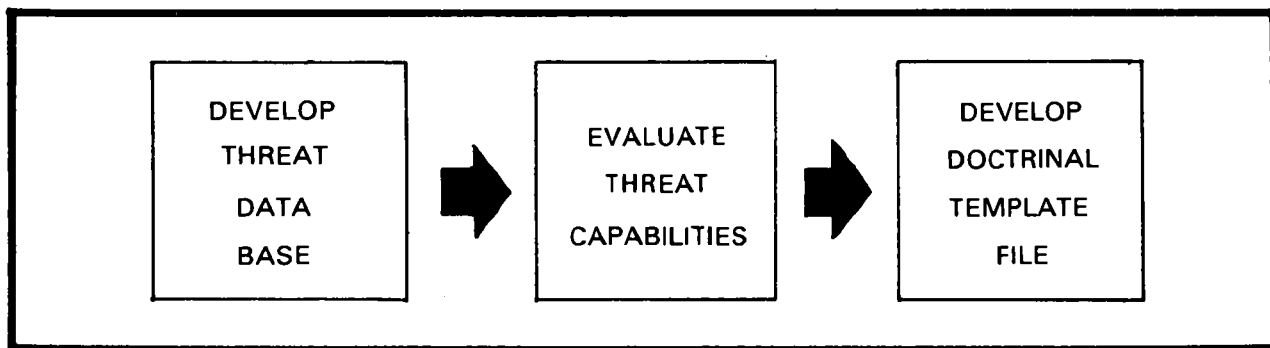


Figure 4-24. Threat evaluation.

The first and most vital step in the process is the development of the threat data base. The development of a comprehensive data base on potential enemy forces provides the basis for the evaluation of the enemy's doctrine and capabilities.

The development of the threat data base requires a review of the mission and the potential AO or AI. This review identifies the enemy ground, air, naval, and irregular forces which may be encountered.

After the enemy forces have been identified, information required to evaluate their capabilities and doctrine is assembled. Primary sources of this information include--

- OB books and handbooks.
- Area handbooks and studies.
- Analyses, estimates, IPB products, and reports from higher headquarters.
- Doctrinal and training publications.
- Open-source literature.

As information about the enemy is assembled, information gaps become apparent. As these gaps are identified, they are forwarded as information requirements (IR) to the collection management and dissemination (CM&D) section for processing as requests for intelligence information (RIIs). RIIs which cannot be satisfied by existing information are identified as intelligence gaps and used to generate collection requirements.

Channels for requesting OB information normally depend on the nature of the information and the intelligence structure applicable to the requesting unit. European-based units will generally follow different request procedures than units based in CONUS or Korea.

The second step in the threat evaluation process is the evaluation of threat capabilities. These capabilities are evaluated based on their relationship to the battlefield area and the friendly mission. This evaluation provides the basis for doctrinal templating.

When the threat data base has been developed and the threat capabilities evaluated, the analyst must then determine which doctrinal templates are required. All necessary templates must be identified, but the number of templates must be limited to the essentials. All possible situations, battlefield environments, and doctrinal variations cannot be predicted. Therefore, the analyst must establish doctrinal template requirements which reflect the conditions of their mission and potential AO.

Friendly commanders are normally interested in the threat echelon immediately above their own because this is the echelon that directs the battle against them, and two echelons below their own because these are the echelons they must actually plan to fight. Thus, a division commander would be interested in the organization and tactics of opposing threat elements from army to battalion. Figure 4-25 provides an example of corps, division, and brigade echelons of interest.

Knowledge of threat doctrine provides a starting point for determining which doctrinal templates may be required. For example, doctrinal templates reflecting the sequence of a threat unit attack from its assembly area to its final objective may be required. This sequence might include--

Friendly Echelon	Battle Directed By	Opposed By	Avenues of Approach	Maneuver Elements
Corps	Front	Army	Division	Division Regiment
Division	Army	Divisions	Regiment	Regiment Battalion
Brigade	Division	Regiments	Battalion	Battalion Company

Figure 4-25. Corps, division, and brigade echelons of interest.

- March formation.
- River crossing (assault river crossing from the march or prepared river crossing).
- Prebattle formation.
- Attack formation.
- Envelopment.
- Pursuit.

Doctrinal templates can be prepared for enemy defensive scenarios which depict hasty and prepared defenses, withdrawal, reinforcements, and locations and movements of counterattack forces.

One method of determining which operations and units should be templated is to develop a matrix. The matrix shows which types of operations and units that are expected to be encountered and provides a clear record of what has been determined. Figure 4-26 shows an operations or unit matrix.

The analyst identifies gaps in doctrinal template holdings by comparing known template requirements with what is actually onhand or available. The required templates are then requested or prepared by the ASPS or BICC at echelon corps and below (ECB).

Types of Operations Types of Units	March Formation	Prebattle Formation	Attack Formation	Attack Against A Defending Enemy	Frontal Attack	Flank Attack	Envelopment	Meeting Engagement	Pursuit	Assault River Crossing from the March	Prepared River Crossing
Motorized Rifle Division	X			X	X	X	X	X	X	X	X
Motorized Rifle Regiment	X	X	X	X	X	X	X	X	X	X	X
Motorized Rifle Battalion	X	X	X	X				X		X	
Independent Tank Battalion	X	X	X	X	X				X	X	
Tank Division	X			X	X	X	X		X	X	X
Tank Regiment	X	X	X	X	X	X	X	X	X	X	X
Tank Battalion	X	X	X	X				X		X	

Figure 4-26. Example of an operations or unit matrix.

Doctrinal templates for several divisions are developed by the corps and distributed to subordinate units. This conserves manpower and serves to standardize the threat perception throughout the corps. After receiving the doctrinal templates from higher headquarters, the receiving element then modifies or expands the doctrinal templates to meet the requirements for their particular echelon or mission. A standardized set of Soviet doctrinal templates, keyed to 1:50,000 scale maps, is available through US Army training aids support centers (TASCs). GTA 30-1-24 consists of a set of 29 templates depicting doctrinal deployments for combat and combat support units at echelons from battalion to Army. When available doctrinal templates have been acquired, they are compared with requirements to determine which additional templates must be prepared locally, and with the data base to determine their accuracy relative to actual conditions.

The comparison of the standard doctrinal templates with the threat data base may reveal doctrinal deviations in the composition of enemy units. For example, a motorized rifle division (MRD) is composed of motorized rifle, tank, artillery, and other types of combat and combat support units. However, the actual composition of a specific division may

differ somewhat from doctrine, and from the composition of other MRDs. One division may have more or fewer tank battalions. Another division may have the doctrinal number of tank battalions, but those battalions may be equipped with T-72 instead of T-64 tanks. Differences from doctrine are based on the available resources, the mission of the unit, and its AO.

The same is true for unit organization. A standard doctrinal organization exists for each type of unit. However, most actual units vary from this standard organization to some degree. Actual unit organization is based on the unit's mission or its organizational category. The organizational structure depicted on the standard doctrinal templates is modified for specific units based on current intelligence holdings.

When the composition and organization have been determined, the unit's deployment is evaluated. Again the process begins with the doctrinal approach. The doctrinal deployment pattern of the unit is evaluated. This includes an evaluation of the spacing between echelons, frontages, depths, and doctrinal rates of movement for various types of operations. This evaluation determines how a specific unit may deviate from the doctrinal norm in its deployment pattern. These deviations may be based on the types of equipment the unit has, the efficiency of its communications or leadership, and the unit's mission.

In addition to a unit's composition, organization, and deployment deviations from doctrine, the unit's history, training, and key personalities are assessed to determine what doctrinal deviations they might reveal. Information on unit history, training, and personalities is extracted from the data base.

Recent history provides a record of the current unit composition and organization, and the deployment patterns employed by the commander. During peacetime, this information is based on the unit's performance during field exercises. This type of information is generally available from national or theater-level agencies. During wartime, the record is based on information received from friendly units which have fought the enemy unit. Key personalities, particularly commanders, provide other clues as to how the unit will deploy and fight, and its vulnerabilities to and use of deception.

Once this information has been assimilated, and accurate composition, organization, and deployment profiles have been established for specific units, doctrinal templates reflecting doctrinal deviations are prepared. Figures 4-27 through 4-30 are examples of doctrinal templates.





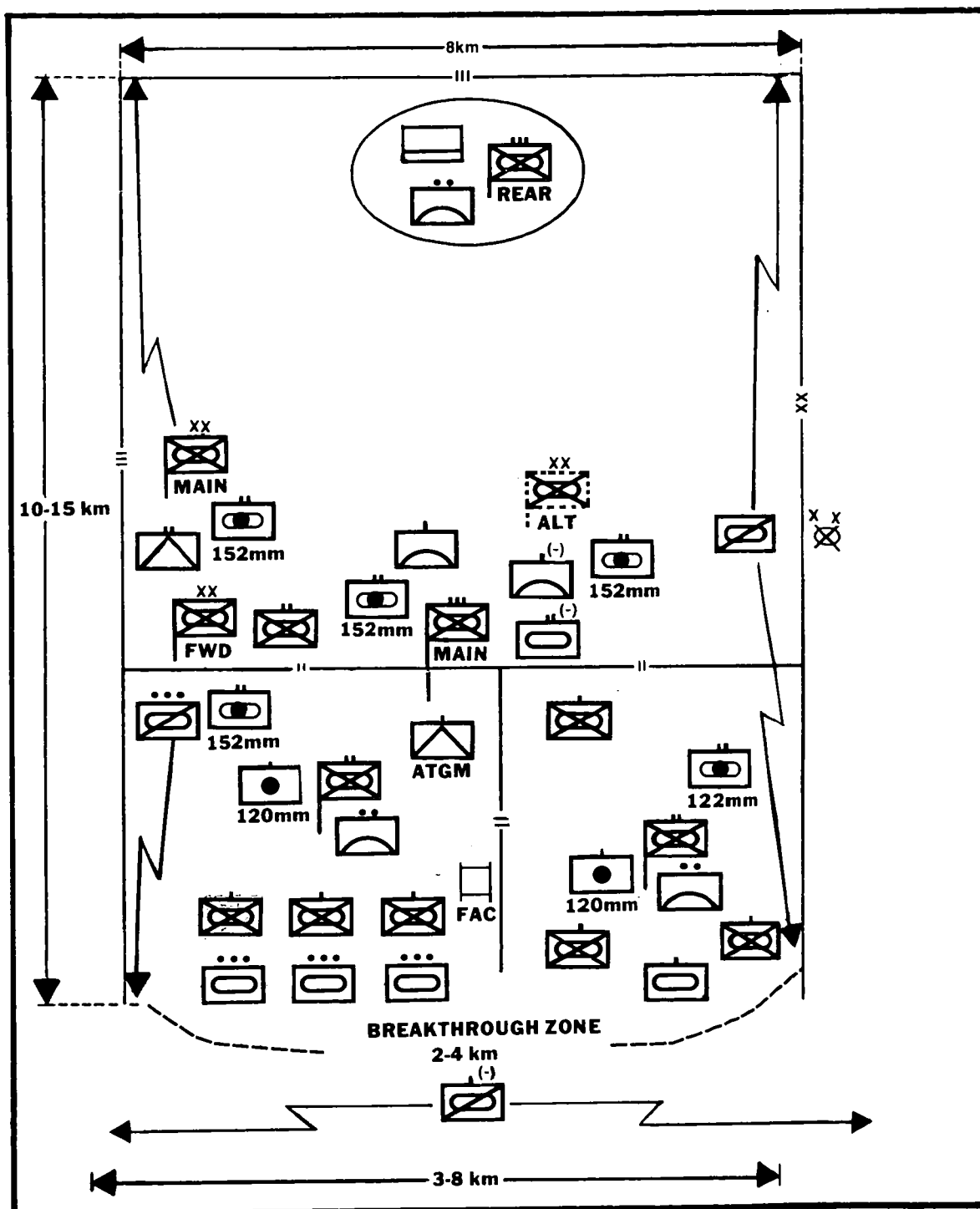


Figure 4-29. Doctrinal template: MRR (BMP) main attack prebattle formation (breakthrough).

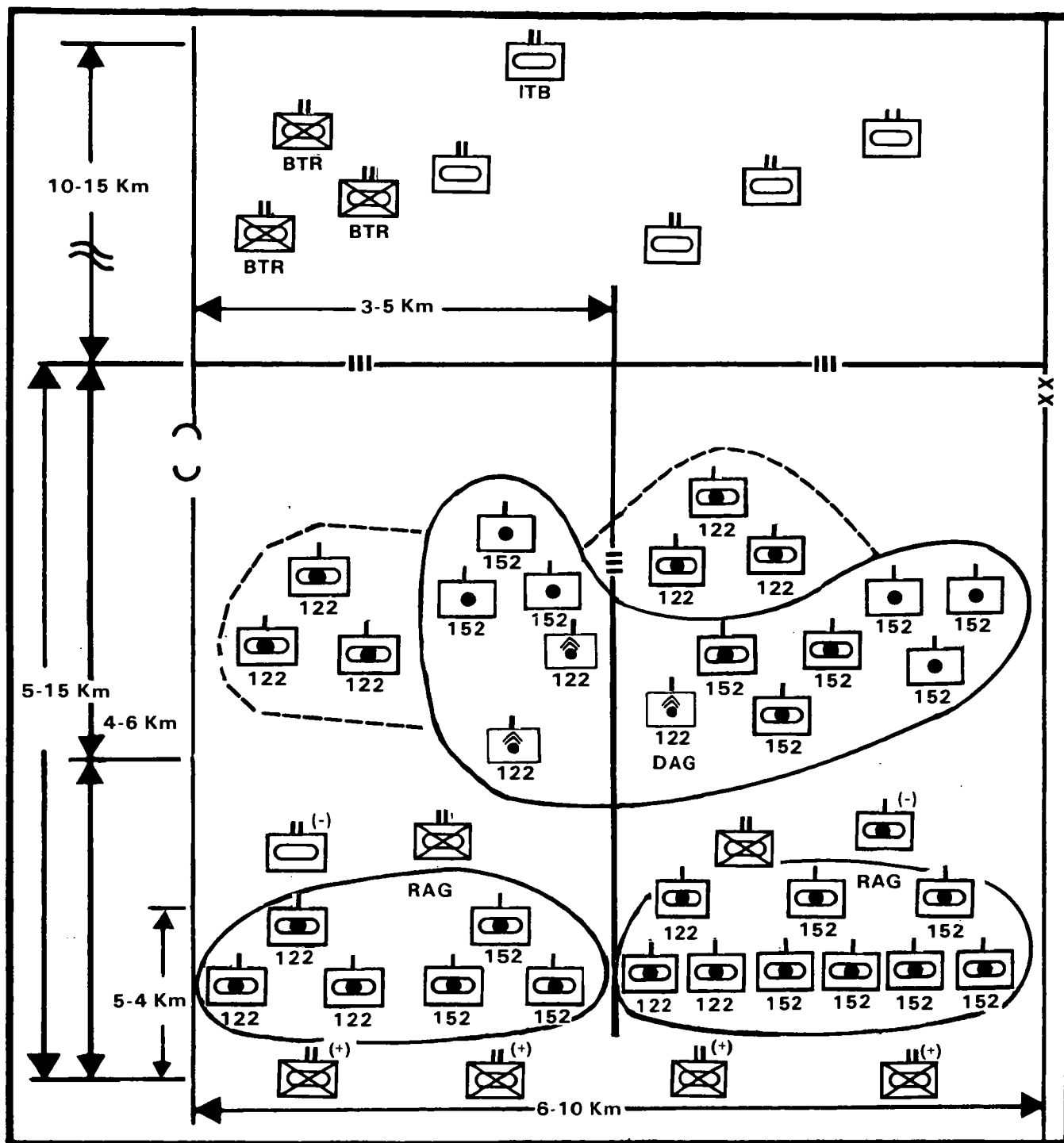


Figure 4-30. Doctrinal template: MRD (primary attack) with RAGS and DAGS.

DOCTRINAL TEMPLATE USES

Doctrinal templates are invaluable to IEW and operations staffs. Doctrinal templates are used to--

- Develop situation templates.
- Assist in determining types of units.
- Identify gaps in intelligence holdings.
- Provide a basis for collection planning.
- Assist in locating enemy units, weapons, equipment, and unit boundaries.
- Assist in locating and identifying HVTs.

Although doctrinal templates are used in the development of situation templates, additional information is required before the situation template can be prepared. The AOs and AIs must be evaluated, and the weather and terrain analyzed. These efforts may be accomplished concurrently with the development of the doctrinal templates.

Doctrinal templates are used by intelligence, operations, and fire support personnel to fulfill further IPB templating requirements and to assist in identifying HVTs. They aid the analyst in predicting, tracking, locating, and targeting enemy high value systems in support of the commander's battle plan. In addition to identifying gaps in intelligence holdings and unit collection planning, doctrinal templates are used as a basis for planning operations before hostilities begin, and to update the data base during combat.

When doctrinal templates identify gaps in intelligence holdings and collection planning, the analyst will develop specific information requirements to fill these gaps and coordinate these requirements with the CM&D section or the EACIC collection management section. The CM&D section will then develop specific orders and requests for R&S and target acquisition assets to collect the required information.

THREAT INTEGRATION

When the evaluation of the threat is completed, the information is integrated with the analysis of the weather and terrain. The threat integration function is continuous and combines the analysis of the enemy's doctrine with the weather and terrain to determine how the enemy might actually fight within the specific battlefield environment.

Threat integration is accomplished through the development of situation, event, and decision support templates. Doctrinal templates and weather and terrain factor overlays provide the basic tools for threat integration. Figure 4-31 shows the developmental steps in the threat integration process.

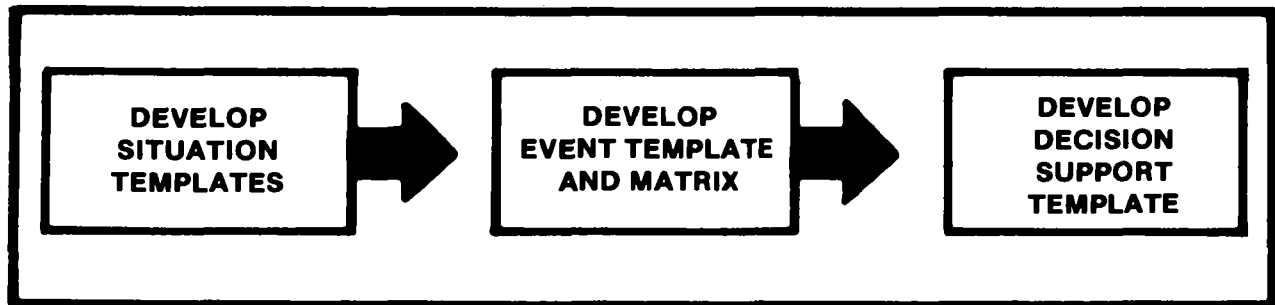


Figure 4-31. Developmental steps in the threat integration process.

SITUATION TEMPLATING

The initial template prepared during threat integration is the situation template. The situation template is basically a doctrinal template with weather and terrain constraints applied. It shows how the enemy might deviate from doctrinal dispositions or adjust frontages, depths, or echelon spacing to account for weather and terrain effects. Doctrinal templates and the MCOO (or the combined obstacle overlay and avenues of approach overlay) are the basis for developing situation templates.

Situation templates focus on operations in specific mobility corridors within avenues of approach. They graphically depict how threat forces might adjust doctrinal formations to move, shoot, and communicate within these mobility corridors. Situation templates are prepared not only for the obvious mobility corridors but for the difficult corridors that offer the enemy the potential of achieving surprise. Based on these assumed adjustments, we can then determine where the enemy commander might place ground surveillance radars, CPs, communication sites, weapons systems, combat support elements, CSS facilities, and concentrated air assets.

As an enemy force moves along a mobility corridor, it might fight through or bypass built-up areas, constrict its frontage to pass through choke points, and negotiate water obstacles. As this occurs, areas within the mobility corridor begin to relate to terrain and situation-dependent actions the commander must take.

Situation templating is basically a visual technique. By placing a doctrinal template over a segment of a mobility corridor, the analyst visually notes where terrain and weather factors make enemy deployments extremely difficult or impossible. The analyst then adjusts unit or equipment dispositions to depict where these elements might actually be deployed in the situation. It is obvious that the enemy has other options, and the analyst tries to view the situation through the eyes of the enemy commander. The enemy's desire to appear ambiguous and to achieve surprise are also considered. These factors are integrated with the most likely tactical alternatives open to the enemy.

Situation templating should not be the work of a single analyst. Three analysts using the same doctrinal template will develop three different situations for the same area. As each of these situations will probably depict a possible enemy alternative, no single one will provide the correct solution. Each situation must therefore be analyzed, with the possibility that several templates depicting alternative dispositions may be developed for a single area.

As situation templates are visualizations of potential enemy actions at a certain time and place on the battlefield, they change as enemy forces move along the mobility corridor. As enemy forces move, their actions continue to be influenced by weather, terrain, and tactical situation. Since this movement is sequential, situation templates are sequential snapshots of how the enemy force might appear as it moves.

The credibility of situation templates is directly related to the accuracy of the threat evaluation, terrain analysis, and weather analysis processes.

Figures 4-32 through 4-35 show the development of situation templates.

A doctrinal template of an MRR as the lead element of a division is overlayed on a specific area. It is obvious that the doctrinal frontages, depths, and unit configurations do not conform to the confines of the terrain.

The dispositions of the regimental elements are realigned to conform to the terrain. These alignments are changed to form a series of snapshots showing how the regiment might move through the terrain.

Unit frontages, depths, and echelon spacing are adjusted to fit the terrain but kept as close to doctrine as possible.

The final snapshot of the regiment's move through the mobility corridor reflects a type deployment for an MRR. The final snapshot would be situation dependent.

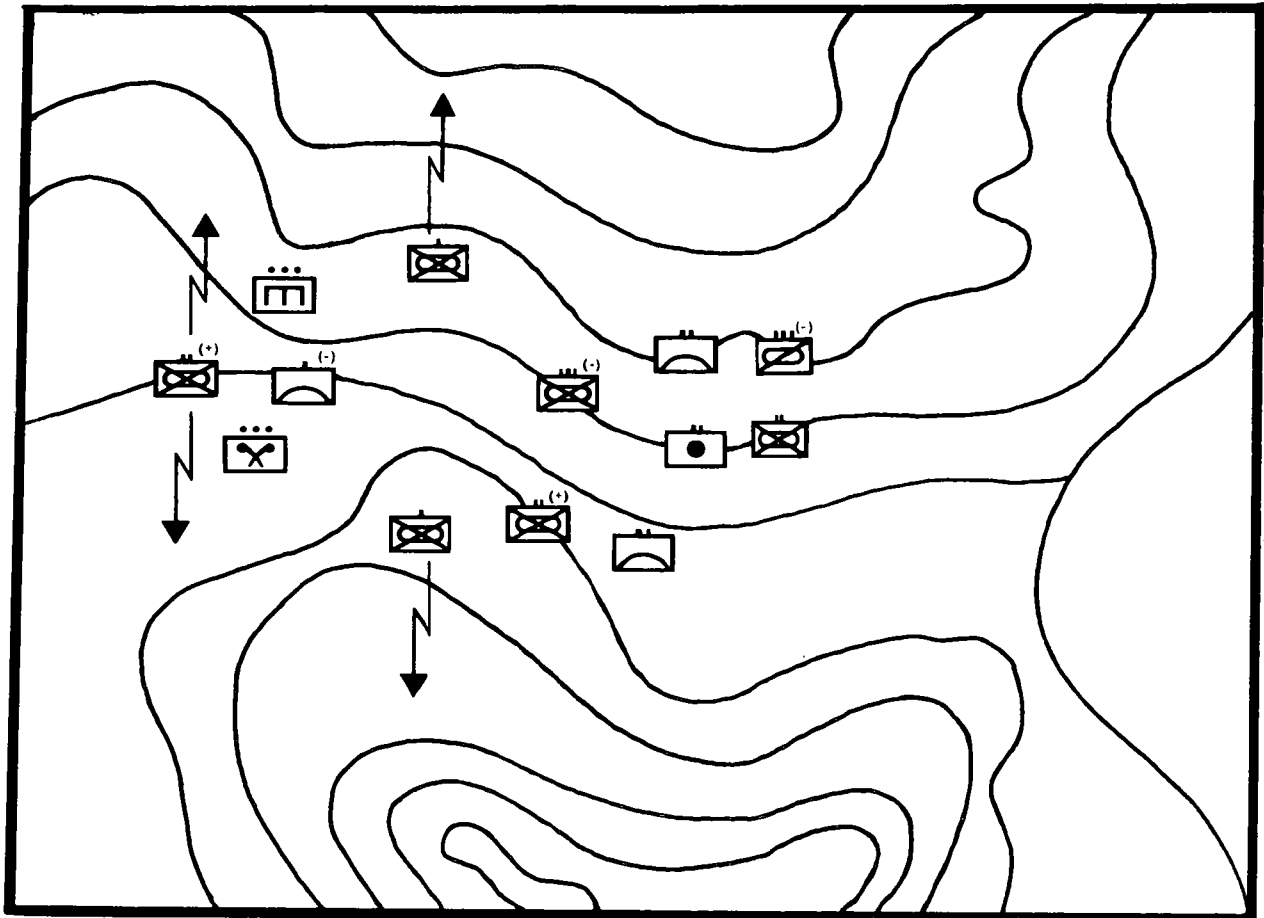


Figure 4-32. Doctrinal template: MRR as a lead element of an MRD.

Situation templating is not performed independently and without knowledge of current dispositions. In fact, use of a doctrinal template on a current SITMAP will enable the analyst to predict the probable locations of enemy elements by type and echelon, based upon current weather and terrain constraints. The resultant situation provides a more complete picture of the situation and provides a basis for event templating and collection planning to confirm or deny the existence of the probable enemy elements. To distinguish confirmed enemy elements and activities from units estimated through doctrinal templating, estimated unit symbols are drawn with broken or dashed lines.

Space and time analyses are important in developing situation templates through their use in the wargaming process. The projections of enemy activities based on space and time analyses play a key role in situation and target development. Space analysis determines whether a

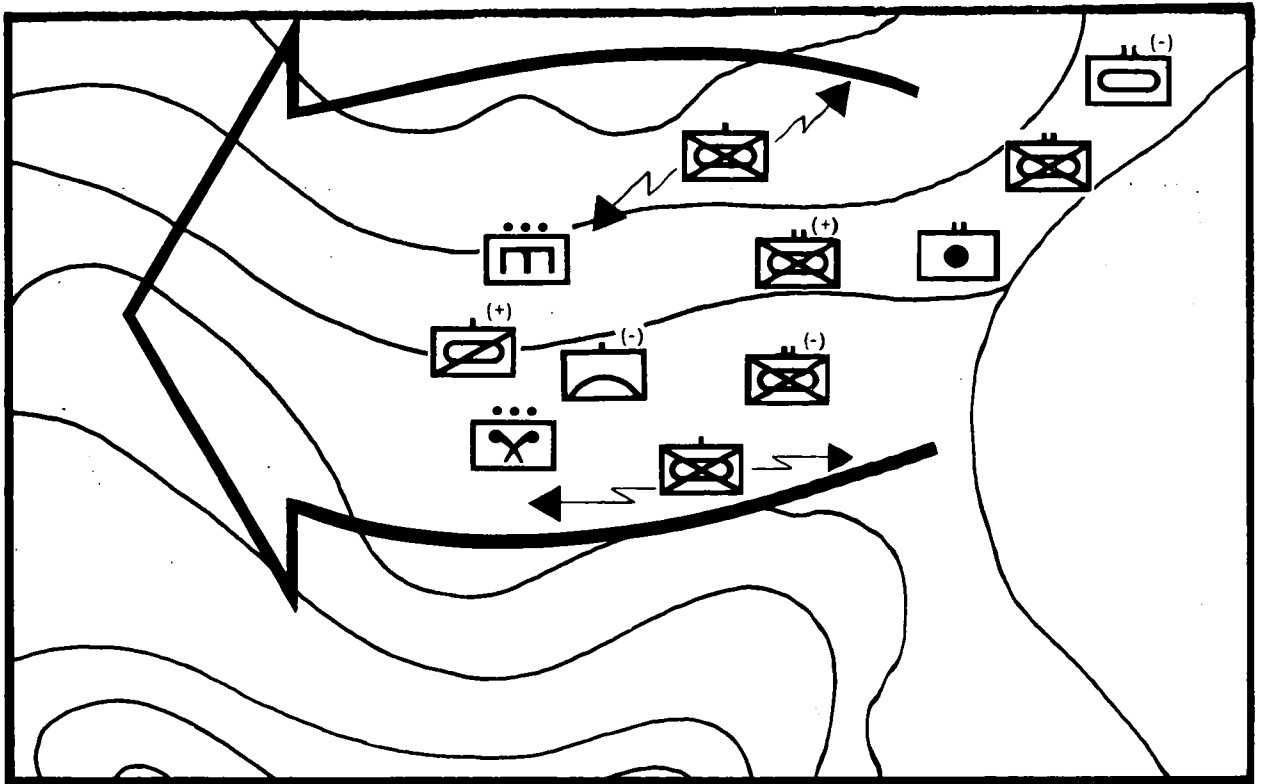


Figure 4-33. Situation template: MRR as a lead element of an MRD.

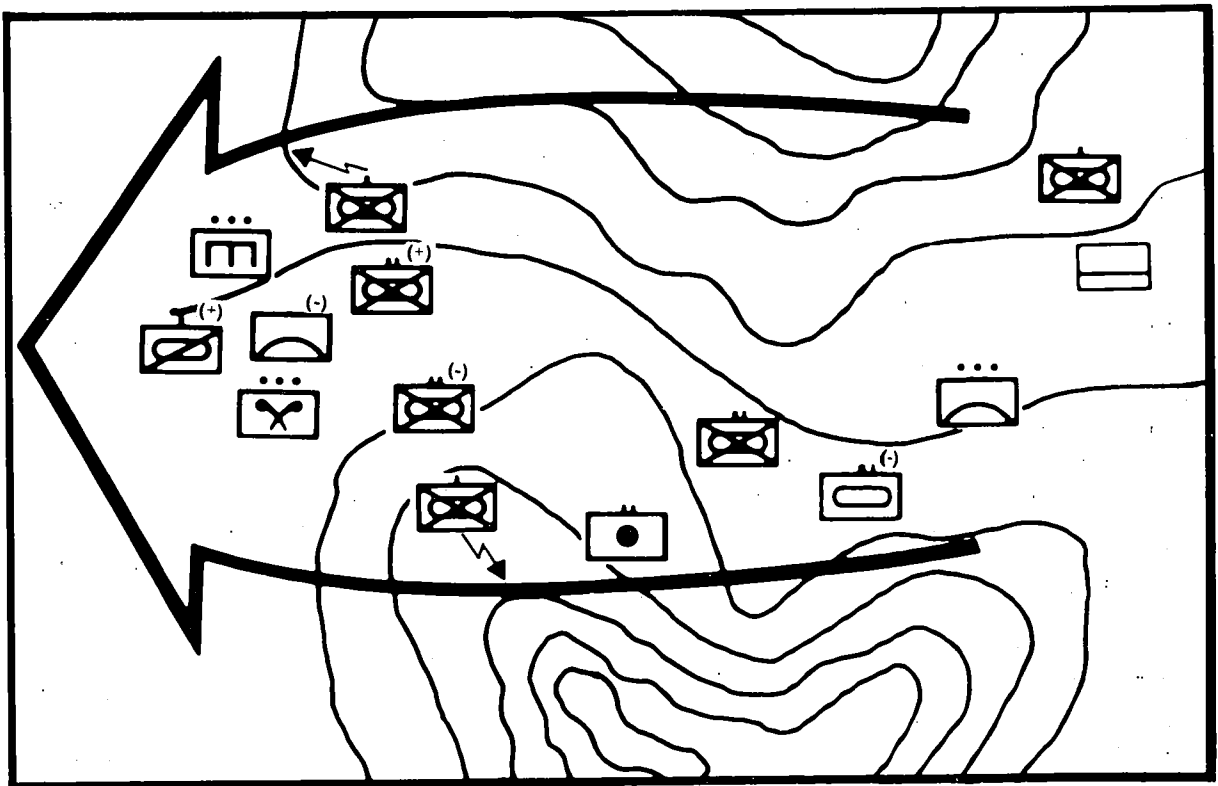
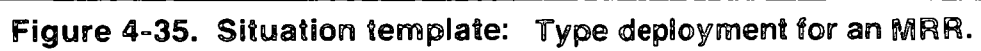


Figure 4-34. Situation template: MRR with unit dispositions adjusted to terrain constraints.



particular unit or battlefield function can maneuver or use specific terrain in a specific situation. Avenues of approach and mobility corridors determine whether or not an area can accommodate maneuver. OB data and the intelligence data base assist in the development of zones of action for enemy offensive and defensive frontages, depths, and airspace. By reviewing the battlefield and using space analysis, the analyst can determine where the enemy is, whether the enemy is able to use the terrain for their purposes, and the tactical adjustments required to operate within specific mobility corridors.

EVENT TEMPLATING AND THE EVENT ANALYSIS MATRIX

Situation templating is the basis for the second template prepared during the threat integration process--the event template.

The Event Template

Event templating identifies and analyzes significant battlefield events and activities which provide indicators of enemy courses of action. It is a projection of what will probably occur if the enemy adopts a particular course of action. By recognizing what the enemy can do, and by comparing it with what the enemy is doing, we can predict what the enemy probably will do next.

Event templating is as critical to offensive and air-associated operations as it is to defensive operations. During offensive operations, the event templating development process is expanded to include event templates depicting how the enemy commander perceives the friendly attack and how the enemy might potentially counterattack. In addition to determining the particular defensive courses of action the enemy might adopt, these additional templates help the analyst predict where the enemy can be expected to employ enemy intelligence collection assets, and where and when any potential counterattack may originate. The same is true for air and air-associated operations. Event templating relates airspace activities and events to points on the ground, and projects how the enemy might use airspace in support of a particular course of action. Airspace event templating requires a detailed knowledge of aircraft flight profiles, attack techniques, and service ceiling limitations, and of air defense radar and weapons systems ranges and capabilities.

The predictions and projections developed through event templating are an important factor in determining the enemy's posture and movement. Knowledge of when and where activity is likely to occur on the battlefield provides indicators of enemy intentions, or verifies that projected events have or have not occurred. Battlefield events are predicted through situation development. Situation development takes place during the prehostility or predeployment phase of operations and the results are verified or refuted during actual combat. Verification of a specific situation or event takes place during the process, analysis, and production phases of the intelligence cycle.

The event template depicts named area of interest (NAI) along each avenue of approach and mobility corridor and the relationship of events between separate avenues of approach and mobility corridors. It provides a means of analyzing the sequence of activities and events that should occur for each potential enemy course of action and how they relate to one another. The event template is developed by wargaming each potential enemy course of action from the point where friendly or enemy activity begins to the final objectives. Figure 4-36 shows an example of a ground operation event template.

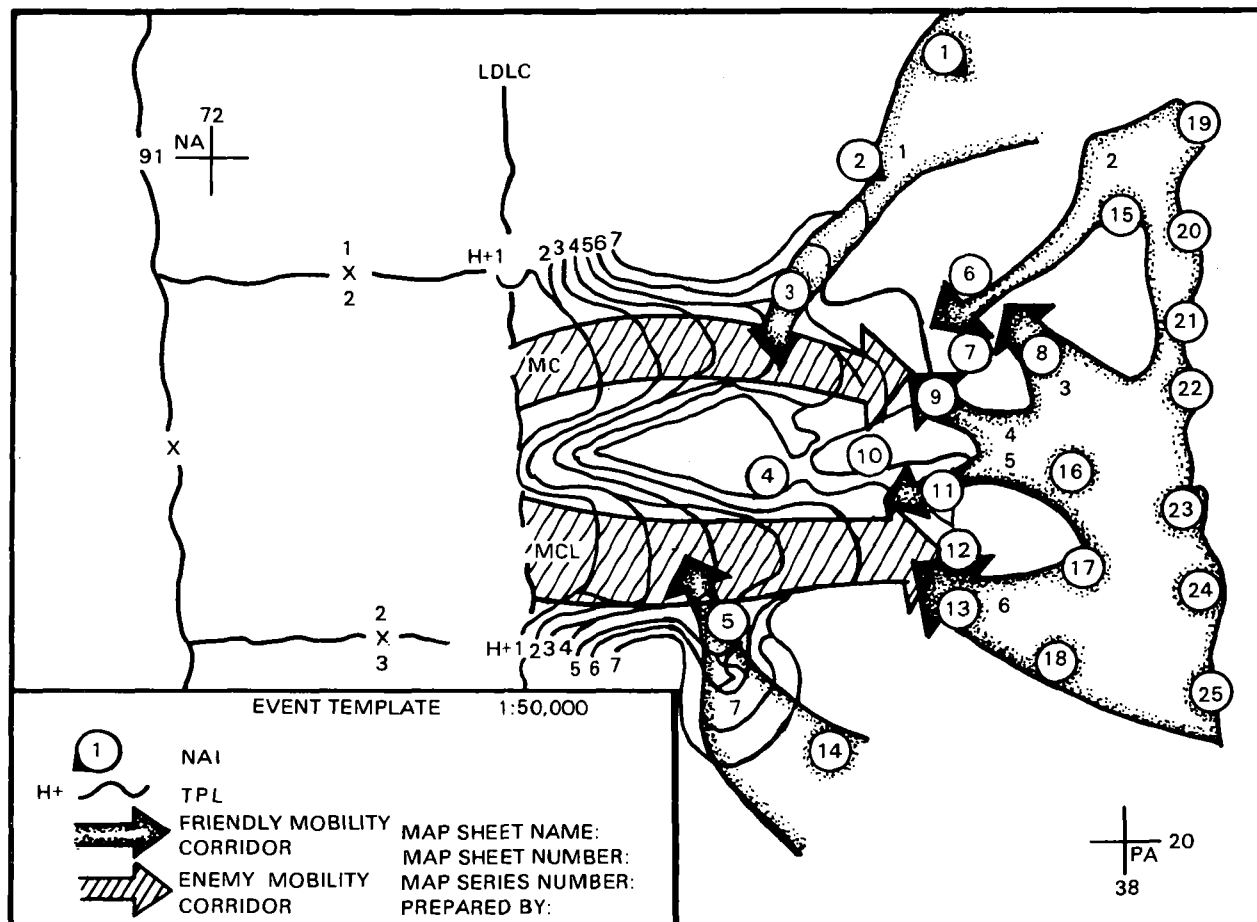


Figure 4-36. Ground event template.

Airspace (third dimension) analysis may be included on an event template or as a separate event template. Specifically, enemy air avenues of approach and mobility corridors and air named areas of interest (NAIs) will be depicted. Normally, air avenues of approach and mobility corridors will conform closely to ground mobility corridors, but will be

adjusted with respect to aircraft maximum and minimum operating altitudes, attack profiles, and attack techniques. Both fixed and rotary-wing aircraft will employ low-altitude attack profiles within selected mobility corridors. Helicopters will employ various attack techniques in direct support of ground forces during all phases of operations. Fixed-wing aircraft will provide both CAS and battlefield air interdiction (BAI) support, and will strike fixed and semifixed targets beyond artillery and missile ranges.

As with the ground event template, the air event template assists the collection manager in formulating intelligence collection requirements. However, due to the nature of the airspace medium and the great speeds at which aircraft move through this medium, NAIs must be keyed to points on the ground, and time-phase lines (TPLs) are not effective for time analysis.

Aircraft need not adhere to friendly or enemy unit boundaries. Therefore, the collection manager must base the collection requirements on specific avenues of approach and mobility corridors; on knowledge of aircraft attack profiles and techniques; and on the capabilities of air defense systems. As aircraft are tied to airfields or FARPs, these facilities also play a key role in the development of airspace collection requirements. Figure 4-37 is an example of an air event template.

The event templating process and the wargaming employed in its development become more formal at higher echelons. At brigade and battalion, the event templating process may be entirely a mental exercise. However, at division, corps, and EAC the development of formal event graphics is necessary to support the analysis of probable enemy courses of action over multiple avenues of approach and mobility corridors; and to direct the multiple and varied collection, reconnaissance, and target acquisition assets controlled by these echelons.

As forces move along avenues of approach and mobility corridors, critical areas become apparent. These areas are critical because they are where significant events and activities will take place. It is within these areas that targets will appear. These critical areas are designated as NAIs during the event templating process.

An NAI is a point or area along an avenue of approach or mobility corridor where activity will confirm or deny a particular course of action. NAIs can be a specific point on the ground, a specific movement route, or an area. When possible, NAIs are placed in numbered sequence along an avenue of approach or mobility corridor. This facilitates the calculation of movement times between specific NAIs and limits confusion as to the specific avenue or corridor under consideration. Figure 4-38 shows the symbols for point, area, and route NAIs.

NAIs facilitate intelligence collection, R&S asset employment, and intelligence analysis because--

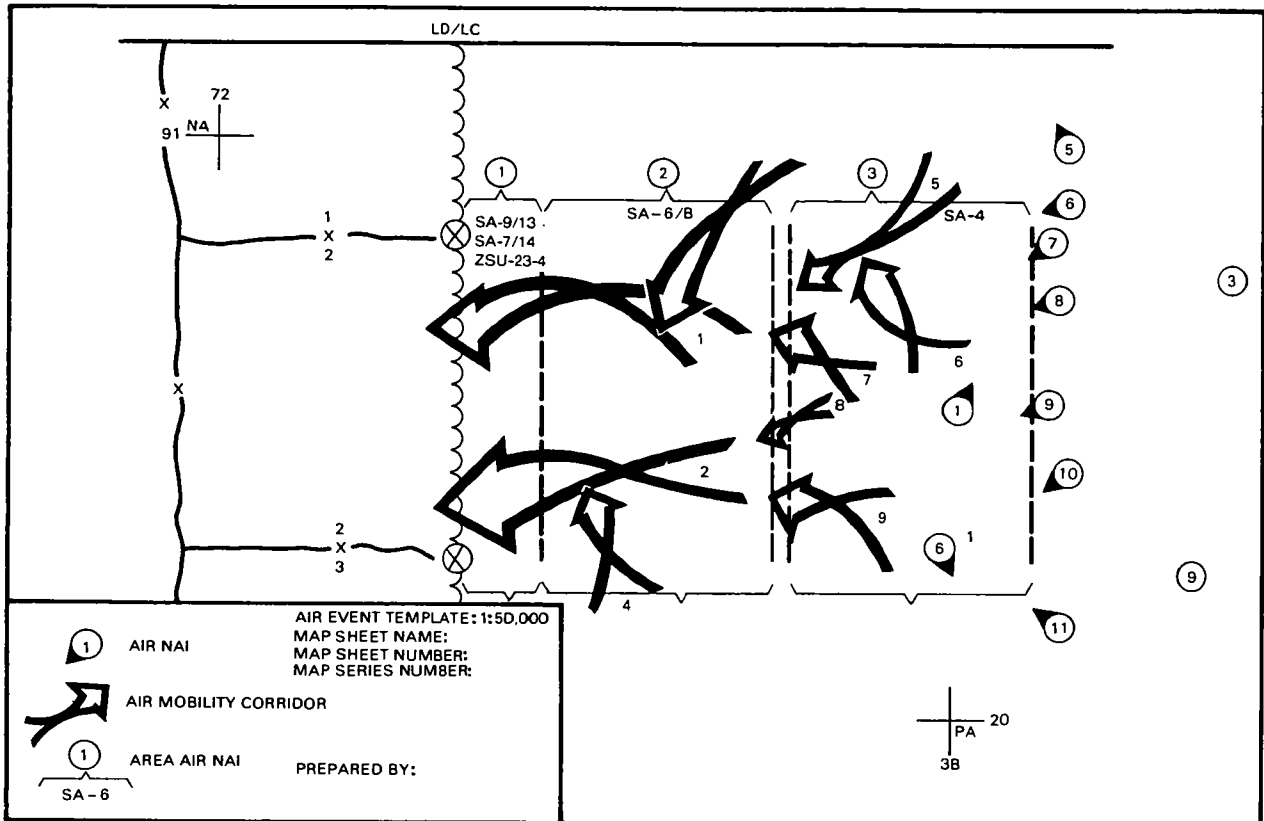


Figure 4-37. Air event template.

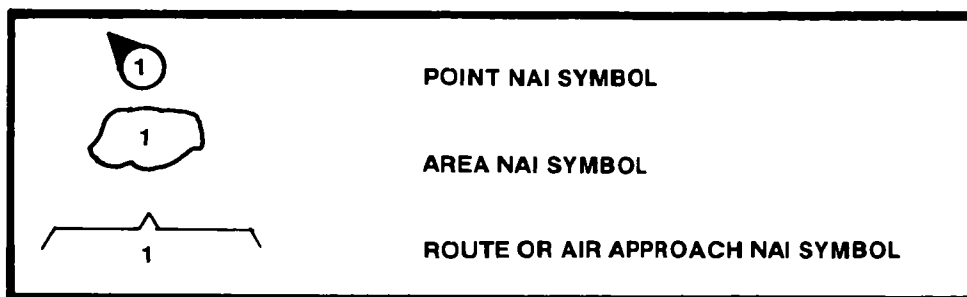


Figure 4-38. NAI symbols.

- They focus attention on areas where the enemy force must appear if it has selected a particular mobility corridor.
- They delineate when and where the enemy will employ the collection, R&S, and fire support and counterattack elements during friendly offensive operations.
- They frame militarily significant events by time and location.
- Events or activities in one NAI can be compared with events occurring at NAIs in other mobility corridors to provide a basis for determining enemy intentions.
- Information thresholds can be assigned to each NAI. These confirm or deny that the expected activity has occurred within the established time limits.
- Events within NAIs can be analyzed for indicators against which intelligence, R&S, and target acquisition assets can be directed. NAIs are the basis for intelligence collection planning.

TPLs help in tracking enemy movements and assist the collection manager in directing collection assets. They provide a graphic means of comparing the enemy's mobility capability along separate avenues of approach and mobility corridors. TPLs can be computed for all types of enemy movement and operations. In the deep operations they are used to monitor movement along LOC. In close operations they are used to monitor actual enemy formations. In rear operations they are used to monitor the movement of enemy airborne and air assault or OMG forces towards their objectives. TPLs are based on doctrinal rates of movement. These rates of movement are based upon actual experience with the enemy, enemy doctrinal writings, or on peacetime wargaming. Movement rates are adjusted to compensate for the effects of weather and terrain and for friendly actions. During actual operations, TPLs are adjusted to conform to actual enemy rates of movement. Figure 4-39 shows doctrinal rates of movement normally used in TPL computation.

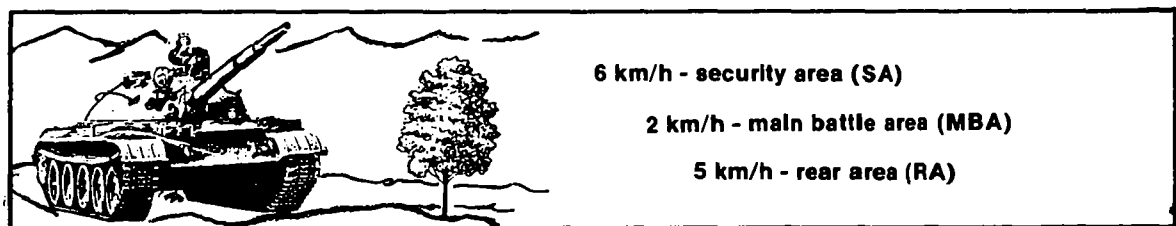


Figure 4-39. Doctrinal enemy movement rates.

The times calculated between NAIs are used to establish TPLs. The initial TPL is identified as "H" (the hour at the enemy FLOT), and successively as H+1, H+2, and so forth, depending upon both the enemy's doctrinal movement rate and the weather and terrain constraints.

Selected NAIs are often keyed to TPLs, or TPLs themselves may become NAIs. TPLs do not replace NAIs. TPLs are transcribed from the event template to the DST across avenues of approach or mobility corridors, thereby reducing the commander's uncertainties about the maximum extent of the enemy's advance within specific timeframes.

During defensive operations, TPLs are developed using the doctrinal enemy movement rates shown in Figure 4-39. However, during offensive operations, friendly TPLs are developed in accordance with the offensive situation and the commander's concept of the operation. They are used as a coordination and collection planning mechanism and are transcribed onto the DST in the same manner as enemy TPLs during defensive operations.

Event templates of potential enemy counterattack options should include TPLs to assist in determining when the enemy can be expected to launch a counterattack. In this case, "H" hour should be the time the enemy is expected to begin the counterattack, and H+1, and so forth, are computed based on doctrinal or actual movement rates.

THE EVENT ANALYSIS MATRIX

The event analysis matrix supports the event template. It correlates expected events and activities within individual NAIs and adds the dimension of time. By employing enemy doctrinal movement rates and analyzing the effects of the terrain and weather on mobility, the time required to move between NAIs along each avenue of approach or mobility corridor can be estimated. Separate event analysis matrixes should be prepared for each avenue of approach or mobility corridor. Figure 4-40 shows examples of event analysis matrixes.

The estimated times required to move between NAIs are expressed in terms of not earlier than (NET) and not later than (NLT) times. The NET time is the earliest that the lead element of an enemy formation can be expected to arrive at or to activate an NAI. NLT is the latest estimated time that a lead element of an enemy formation can be expected to activate an NAI.

NET and NLT times are computed using the doctrinal enemy movement rates shown in Figure 4-27. During combat, these rates are adjusted to conform to actual movement rates. NET and NLT times can be expressed in terms of actual time, or in terms of time beginning with H-hour (H+1:15, H+2:54, and so forth). The commander or actual command requirements will determine how these times are depicted on the event analysis matrix.

AVENUE OF APPROACH			COORDINATES:	
MOBILITY CORRIDOR: 1			COORDINATES: PA 2071 - PA 1076	
NAI ACTIVITY	DISTANCE (KM)	RATE OF MOVEMENT	NET NLT	TIME OBSERVED TIME CONFIRMED
¹ ENEMY RECON ELEMENTS/ GROUPS AND PATROLS MOVE ALONG MC 1	—	—	— H-HOUR	
² ACTIVITY AS PER NAI 1	18 KM	20 KM/H	H+54 MIN H+1/ 9 MIN	
³ RECON ELEMENTS ASSUME SCREEN POSITIONS	20 KM	20 KM/H	H+1/ 54 MIN H+2/ 24 MIN	

AVENUE OF APPROACH			COORDINATES:	
MOBILITY CORRIDOR: 6			COORDINATES: PA 4850 - PA 2840	
NAI ACTIVITY	DISTANCE (KM)	RATE OF MOVEMENT	NET NLT	TIME OBSERVED TIME CONFIRMED
²⁵ ENEMY MRB's CONDUCTING NIGHT RIVER CROSSING WITH ILLUMINATION	—	—	— H-HOUR	
¹⁸ ENEMY COUNTER- ATTACK WITH REINFORCED TB	20 KM	20 KM/H	H+1 H+1/ 15 MIN	
¹³ ENEMY REINFORCED MRB SHIFTING INTO PREBATTLE FORMATION	18 KM	20 KM/H	H+1/ 54 MIN H+2/ 24 MIN	

Figure 4-40. Event analysis matrixes.

EVENT TEMPLATING AND COLLECTION MANAGEMENT

Before combat, the event template and the event analysis matrix depict probable enemy courses of action and provide a basis for comparing friendly and enemy courses of action. During combat the event template and the supporting event analysis matrix focus on probable enemy courses of action.

Event templating enables the G2 and S2 or collection manager to develop precise, prioritized collection requirements based on probable enemy courses of action. This serves to maximize the effectiveness of limited collection resources over extended areas and against a vast array of targets. It provides answers to the questions of where to look, when to look, and for what to look. Together with the situation template, the event template and the event analysis matrix assist the collection manager in establishing collection priorities based on the most likely enemy courses of action. Movers and emitters, the primary indicators of events and activities, can be framed by time and location, allowing the collection manager to determine the optimum mix of collection assets.

Event templating forms the basis for constructing the DST. As such, event templating serves the G3 or S3 and the FSO or fire support element (FSE) by telling them where and when to shoot, jam, and maneuver, and what to shoot, jam, and maneuver against.

Event templating is the vital link between the success of the commander's tactical concept, intelligence requirements, and the collection plan.

DECISION SUPPORT TEMPLATING

Event templating provides the basis for decision support templating. The DST is essentially a combined intelligence estimate and operations estimate in graphic form. It relates the detail of the event template to decision points that are significant to the commander, and identifies critical battlefield areas, events, and activities which require tactical decisions by time and location. The DST does not dictate decisions to the commander, but indicates points where a decision may be required. As such, the DST provides a structured basis for using judgment and experience to reduce battlefield uncertainties and to make decisions.

Development of the DST is the function of the commander's targeting triad. This triad consists of the G2 or S2, G3 or S3, and FSCoord or FSE. However, to be complete and effective, the DST must be developed as a result of a total staff effort. Among the staff members who can be expected to contribute routinely to the development of the DST are the G4 or S4, aviation officer, air defense officer, engineer officer, battlefield deception officer, communications and electronics officer, and chemical officer. Other staff members such as the medical officer may contribute to the DST's development in special situations which require

their expertise. Although it is developed under the coordination of the G2 or S2, once complete, the DST becomes an operational document and is, therefore, briefed to the commander by the G3 or S3.

The commander must make tactical decisions in response to specific battlefield situations and enemy actions. These decisions involve the concentration of combat power for close operations; the delay, weakening, and manipulation of enemy follow-on forces in deep operations; and the placement of assets and development of CI and security functions for rear operations. These decisions are based on the commander's concept for fighting all three phases of the AirLand Battle.

Event templating identifies areas where significant events and activities can be expected to occur and where targets can be expected to appear. Decision support templating identifies areas or points where targets can be attacked, or where specific actions can be taken in support of the commander's concept of the operation. It then relates these points and the associated battlefield events to the commander's decisionmaking requirements. This is done either through the development of target area of interest and decision points (DPs) or through the equation of TPLs with a decision support or operating factors matrix.

Target Areas of Interest

The initial step in developing a DST is to determine where along each avenue of approach or mobility corridor the commander can influence the battle or action by fire, maneuver, or jamming. The areas where we can delay, disrupt, destroy, or manipulate the enemy force, or which are suitable for attacking HVTs, are identified as target areas of interest (TAIs). TAIs are normally areas which were previously identified as NAIs.

A TAI is an engagement point or area, usually along an avenue of approach or mobility corridor, where the interdiction of an enemy force by fire, maneuver, or jamming will reduce or deprive that force of a particular capability. Interdiction may also cause the enemy to abandon its capability. Interdiction may also cause the enemy to abandon or adopt a particular course of action, or force the employment of unusual support to continue operations. If a TAI is intended to force the enemy to use unusual support assets, the TAI must be terrain-dependent, and must inhibit or deny movement.

Sample TAIs include--

- Bridges.
- Road junctions.
- Choke points.

- DZs and LZs.
- Known fording sites.
- FARPs.
- Rear area refueling and rearming points (RARPs).

TAIs can be identified either as point or area TAIs. Point TAIs designate specific target areas for fire support or EW assets. They are normally used in conjunction with assets which require at least a moderate degree of accuracy to be effective. Area TAIs are normally more terrain-dependent and are used with assets which are employed over larger areas (family of artillery scatterable mines (FASCAM), smoke, chemical agents). Figure 4-41 shows the symbols for point and area TAIs.

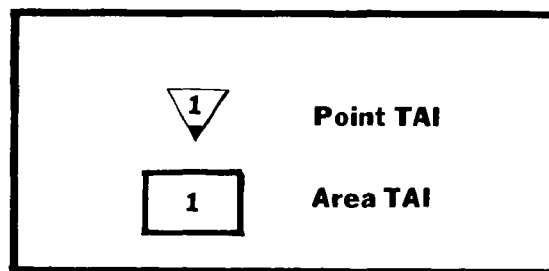


Figure 4-41. TAI symbols.

TAIs which are essential to uninterrupted enemy movement may become HVTs. Other areas may be designated as TAIs because they are good interdiction points along routes over which HVTs are expected to move. TAIs are significant because--

- Targets constitute a basis for the allocation of deep attack resources. Combat resources are limited in terms of capability, quantity, and the time constraints within which they can be employed.
- Targets are subsets of events. If a target does not appear, either through sensing or by analytical deduction, then the event with which it is associated may not have occurred. The massing of artillery in support of a breakthrough operation, or the concentration of forces as part of the second echelon are examples of events which can be confirmed based on target analysis.
- Targets are the basis for determining the combat power of the enemy along specific mobility corridors. The commander must use long-range fires to reduce enemy combat power before these forces reach the forward battle area.

The identification of TAls is a joint intelligence and operations staff and FSE effort. The intelligence staff evaluates enemy forces and the effects of interdiction on their capabilities. The operations staff and the FSE consider the capabilities and availability of the interdiction resources, the effects of the interdiction effort on friendly mission accomplishment, and the priorities for the employment of available resources.

Determining TAls involves target value analysis (TVA). TVA, like the identification of TAls, is a joint intelligence, operations, and FSE effort. TVA considers enemy force doctrine and provides a basis for locating elements which are key to enemy mission accomplishment. These elements are designated as HVTs. The specific elements identified as HVTs are situation dependent, and may include CPs, communications sites, logistics sites, transportation assets, artillery concentrations, engineer assets, IEW elements, and chemical and nuclear weapons delivery means.

A second category of targets is known as HPTs. HPTs are targets, the location and destruction of which provide a significant advantage. The destruction of an HPT deprives the enemy of a specific capability or is advantageous to friendly operations. The commander in support of the concept of the operation designates HPTs. For example, if the enemy must conduct a deliberate river crossing over a wide, deep river within the friendly sector as part of a probable attack, engineer assets are key to the enemy's success. Without these engineer assets the crossing would be impossible; the friendly commander, after being briefed on this HVT, may designate the engineer assets as HPT because their destruction would deprive the enemy of river-crossing capability. If the commander designates the engineer assets as an HPT, the HPT is prioritized with other HPTs for location by intelligence personnel and for subsequent attack or EW targeting.

Doctrinal and situation templating, as well as a detailed knowledge of enemy doctrine and weapons capabilities, will help the analyst locate potential HVTs on the event template and DST. This helps to cue collection assets to the location of possible HVTs during event templating, and to designate TAls during decision support templating.

Decision Points

After TAls are selected, DPs are identified. The identification and location of DPs heavily depend on the availability of fire support, maneuver, combat support, and CSS systems. Therefore, the selection of DPs is primarily a G3 or S3 function, based on the G2 or S2 input of the threat. However, the selection of DPs requires the efforts of the G3 or S3, the G2 or S2, the FSCoord or FSO, their respective staffs, and the principal staff officers of the CS and CSS elements.

DPs identify events, areas, and points on the battlefield where tactical decisions are required, and when these decisions must be made. DPs do not dictate decisions to the commander; they indicate only where tactical decisions should be made in order to have the most effect on the enemy. Decisions must be made early enough to have the desired effect on the enemy. However, they cannot be made until there are indications that particular battlefield events will occur, and their locations confirmed with a high degree of confidence. Therefore, the placement of DPs must be far enough in advance of the expected location of the event or activity to ensure sufficient time to effectively implement the required decision, and close enough to allow confirmation that the expected event will occur. Factors affecting DP placement include the time required--

- For the intelligence collection or surveillance asset to receive the information that the event has occurred.
- To process the information.
- To advise the commander of the activity.
- For the commander to make a cognitive decision.
- To disseminate the decision to the proper fire support, maneuver, or combat support or service support asset.
- For the asset to implement the decision.

Depending upon the level of command, the commander will have a variety of fire, maneuver, and EW options available for employment. DPs are selected based upon these options, and their ability to achieve the desired results against the TAI. Whatever means are selected, some battlefield conditions may permit extensive DP preplanning, while others force the selection of DPs based on immediate missions. As a general rule, DPs for preplanned missions are normally closer to the respective TAIs than those for immediate missions. Table 4-1 provides a set of basic guidelines to assist in determining the placement of DPs for selected assets.

DPs equate time to specific points on the battlefield and are determined by comparing times required to implement decisions, enemy movement rates, and distances. Enemy doctrinal movement rates, adjusted to compensate for the effects of weather, terrain, and friendly interdiction are used as the basis for computation. DPs may be keyed to TPLs. When DPs are keyed to enemy TPLs, the TPLs are based on doctrinal enemy movement rates adjusted to compensate for the effects of weather, terrain, and interdiction (from the event template). When DPs are keyed to friendly TPLs, the TPLs are based on the commander's concept of the operation.

Table 4-1. Basic guidelines for placement of DPs.

ASSET	DECISION IMPLEMENTATION TIME
Maneuver elements	Based on METT-T
Direct fire weapons	Minimum leadtime required
Artillery (including smoke and illumination)	5 to 15 minutes (system dependent)
FASCAM (artillery-delivered mines)	7 to 20 minutes
Attack helicopter units (close 1 to 15 km from FLOT)	1 to 2 hours
Attack helicopter units (deep >15 km from FLOT)	3 + hours
Preplanned aviation or CAS	20 minutes (minimum)
On-call aviation or CAS	Up to 2 hours
Joint suppression of enemy air defense (JSEAD)	Up to 2 hours to coordinate 5 minutes to execute
Hasty NBC decontamination	30 minutes
Detailed NBC decontamination	2 to 4 hours
Air Force Intelligence collectors:	
RF-4 Preplanned	12 to 24 hours
RF-4 Immediate (high priority)	30 minutes to 3 hours
U-2/TR-1 Preplanned	24 to 36 hours
U-2/TR-1 Diversion	5 to 6 hours
SR-71	72 hours
Ground or Airborne IEW	30 minutes (minimum)

DSTs depict TAIs, DP, TPLs, avenues of approach and mobility corridors, objectives, and the current enemy situation (from the current SITMAP and situation templates). Figure 4-42 shows an example of a DST.

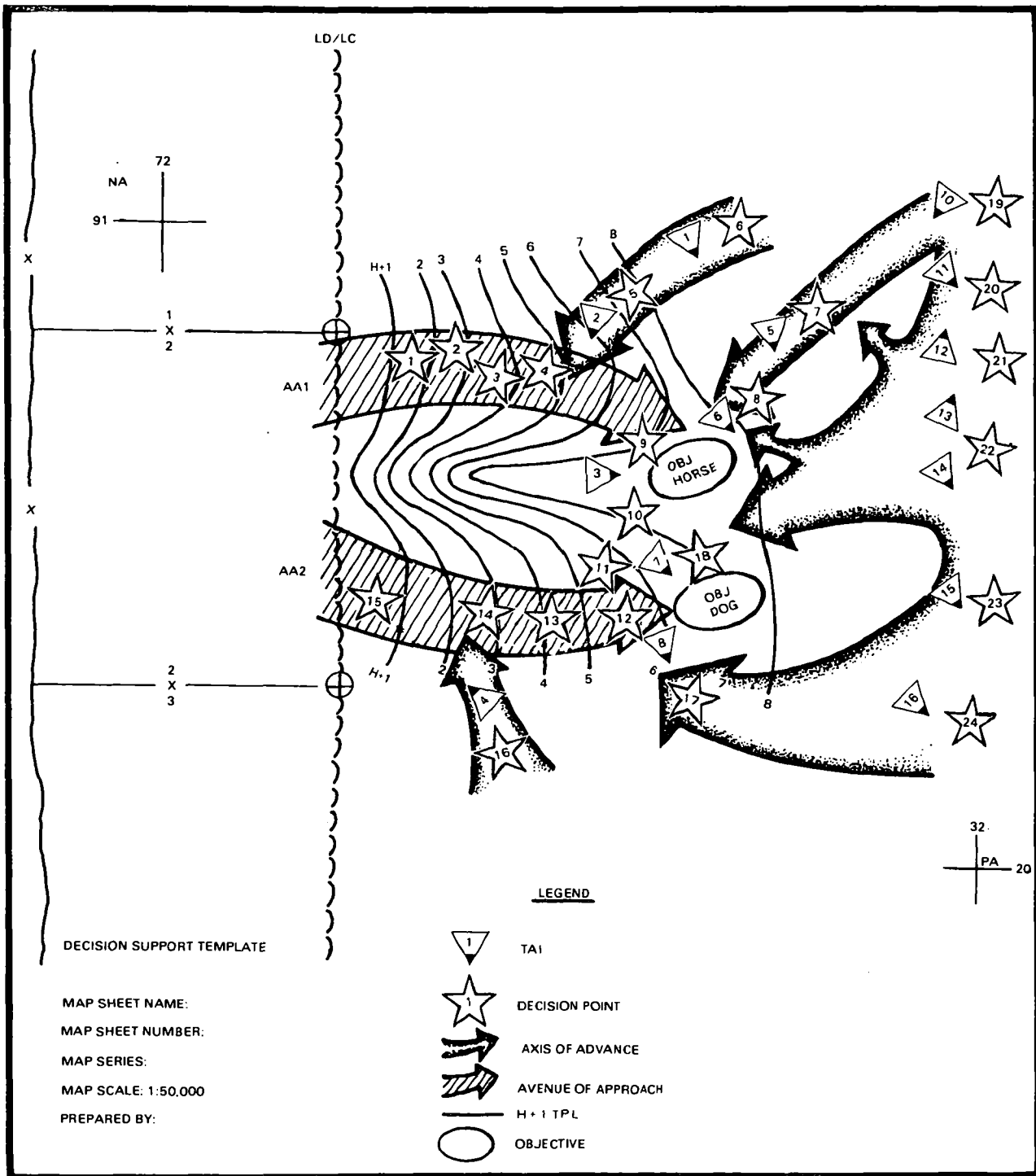


Figure 4-42. Example of a DST.

During friendly offensive operations, the focus of decision support templating shifts from interdicting attacking enemy forces to determining where the commander can best employ assets in support of our own attack. However, it reflects where the enemy is expected to place DP and TAIs. It also shows where and when the enemy might counterattack and the LOCs to be used to reinforce enemy defending forces. This requires a reorientation of analyst perspectives concerning the following:

- The enemy will likely withdraw under pressure along the offensive mobility corridors. TAIs must be identified along withdrawal routes to halt and destroy the enemy in detail during the close operations.
- As the enemy forces are penetrated, the risk of tank-heavy counterattacks on the flanks increases greatly. The DST must show where these counterattacks might occur, and which routes they can employ. TAIs are identified to permit the interdiction of counterattacking forces.
- The enemy is likely to reinforce defending or withdrawing forces with the defending unit's second echelon, the second echelon of the unit's parent organization, or with follow-on elements. The LOC which these reinforcements might employ must be identified and TAIs established. These TAIs will probably be well within the enemy's rear area, requiring the use of friendly long-range operations assets.
- The enemy commander will have a variety of fire, maneuver, and EW options to employ in the defense. These will be dictated by enemy doctrine and the current situation. Enemy DPs and TAIs for the employment of these options must be identified in order to prepare friendly forces for their potential use.

Normally, a single DST is not sufficient to support all the different decision support functions required during offensive operations. Therefore, it is necessary to construct additional DSTs. Individual DSTs or separate overlays for a DST should be prepared for the friendly offensive, enemy defensive, and enemy reinforcement, counterattack options, and operations. As it is expected that the enemy will use all available assets to attempt to blunt the friendly thrust, DSTs for both friendly and enemy air operations also should be prepared.

The air and air-associated operations DST differs significantly from the ground DST. Although the template depicts TAIs and avenues of approach or mobility corridors, it is concerned with air defense, rotary-wing aviation, CAS, battlefield air interdiction, airborne and air

assault operations, and the placement of the facilities and areas which support these operations. TPLs are not depicted on the air and air-associated operation DST because of the high speed of aircraft and the rapid effect they can have on operations. A detailed knowledge of aircraft flight and attack profiles, friendly and enemy air defense capabilities, terrain masking, and the current air OB are critical to the development of the air and air-associated operations DST. Figure 4-43 shows a basic air DST for a defensive operation.

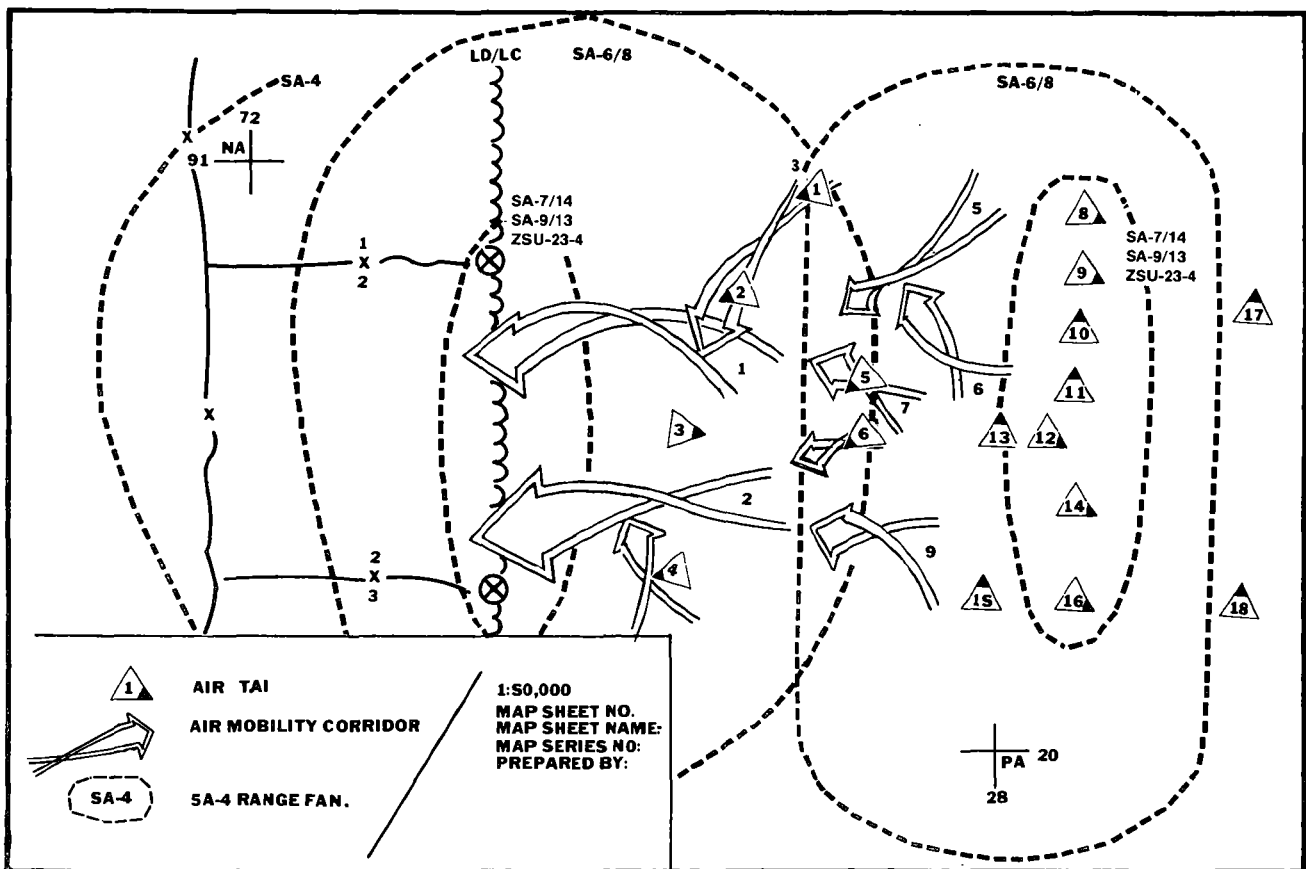


Figure 4-43. Air DST.

During rear area operations, decision support templating helps the rear area commander identify those areas where the commander can deploy air defense, CI, and rear area security elements. Decision support templating also identifies where the rear area commander can place support elements with the greatest degree of security consistent with mission accomplishment.

The rear area commander is concerned with security and CI, as well as with any potential enemy maneuver forces which might enter the area and disrupt operations. The rear area commander must be concerned with specific points along avenues of approach or mobility corridors and with specific events or sequences of events that have been pinpointed on the unconventional warfare SITMAP or population status overlay. These points or events are identified as TAIs.

As combat assets are limited, the rear area commander must employ all means against identified TAIs. This includes effective air defense, the effective defensive posturing of rear area units, the aggressive employment of rear area security units, an active CI effort, and the expedient use of civil affairs and PSYOP units. Samples of rear area TAIs include--

- LZs and DZs.
- Road junctions.
- Forest paths and trails.
- Small groups of individuals (especially in civilian clothes) attempting to move through or evade detection in the rear area.
- Areas with groups or individuals sympathetic to the enemy cause.
- Guerilla and insurgent encampments or headquarters areas.
- Known terrorist operating or headquarters areas.

TAIs normally are identified along high-speed avenues of approach into the rear area. These TAIs and their associated DPs are identified with the consideration that the rear commander will be forced to rely on assets outside their control to effectively stop any major penetration of the area by major enemy forces.

The rear area DST shows TAI DPs, potential enemy objectives, and friendly HVTs (airfields, nuclear depots, missile sites). The template is supplemented by the unconventional warfare SITMAP and the population status overlay. Figures 4-44 and 4-45 show DSTs for airborne or air attack and operational maneuver group (OMG) operations.

The Decision Support Template or Operational Factors Matrix

In addition to the standard method of developing the DST, it can also be developed with decisions keyed to an operational factors matrix. This is especially effective for offensive operations, where the commander can base operational decisions on the TPLs.

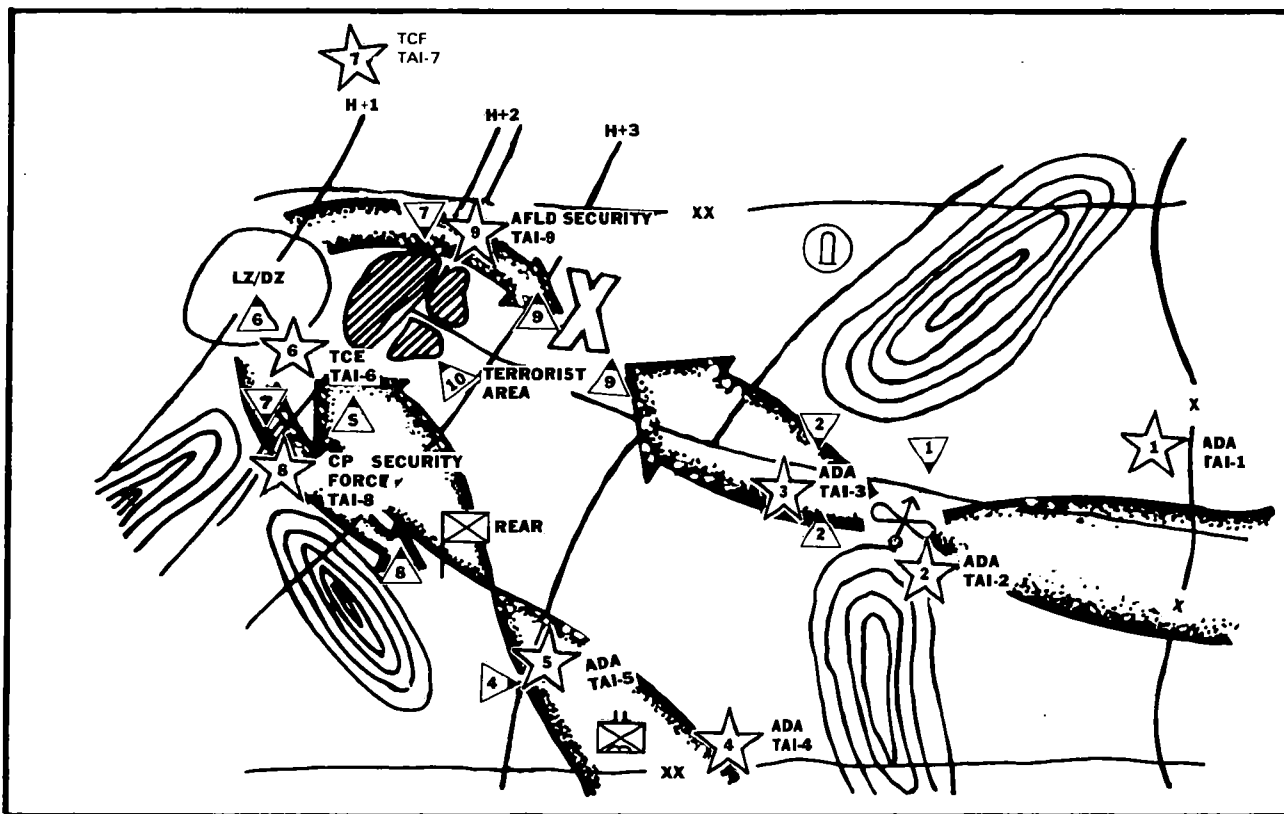


Figure 4-44. Division rear operations DST (level 3) airborne or air attack.

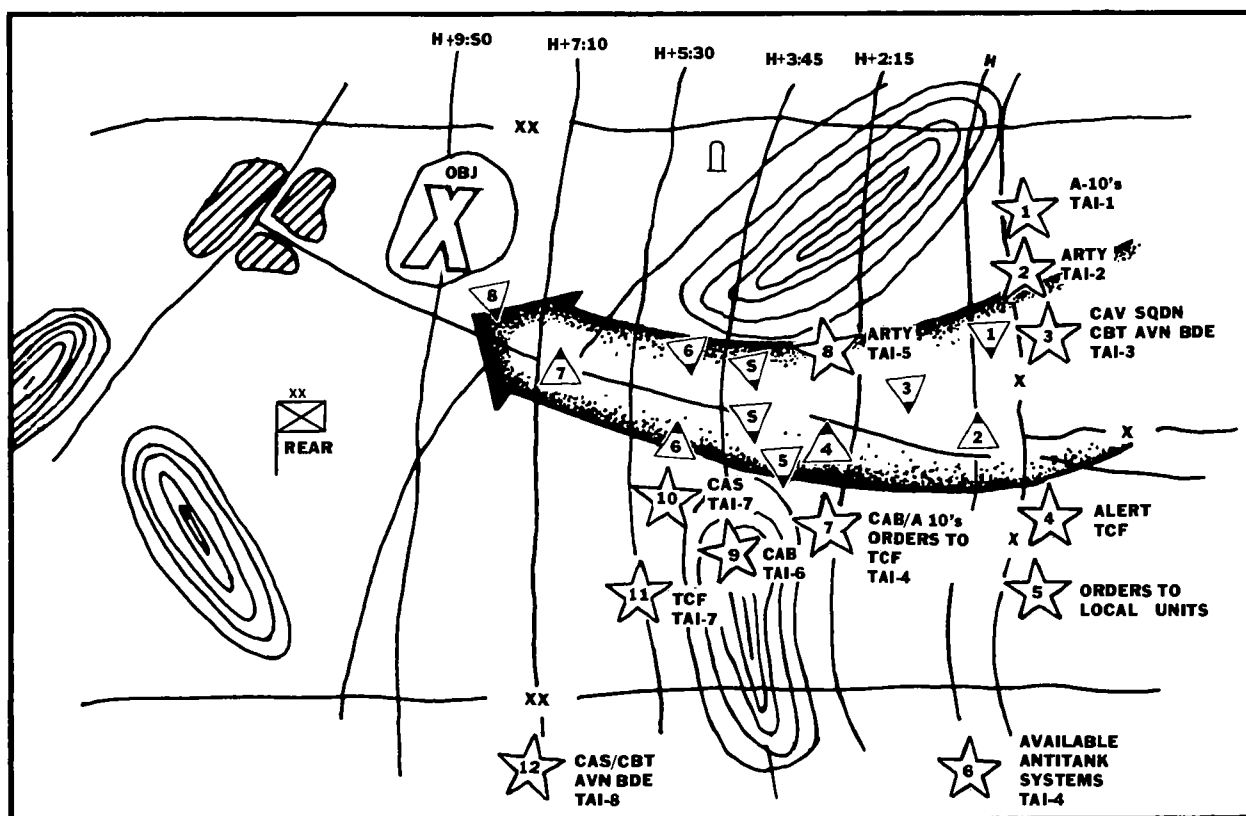


Figure 4-45. Division rear operations DST (level 3) OMG operations.

The decisions required at each TPL are depicted in the operational factors matrix which is placed immediately below the DST operational graphic. The decisions required at each TPL are determined by following the phase lines down into the corresponding column of the matrix. The operational factors normally considered at the tactical level include--

- Intelligence.
- Maneuver (including aviation).
- Fire support.
- ADA.
- Engineer.
- NBC.
- CSS.
- Command and control (C²)

These factors can be addressed in any order. However, this sequence generally corresponds to the sequence in which the factors occur within the five-paragraph OPORD. The operational factors may change based on the level of war or the commander's requirements. Figure 4-46 shows an example of a DST keyed to an operational factors matrix.

Intelligence provides the basis for tactical planning and execution. Detailed planning must be accomplished during static periods; as fluid, dynamic battlefield situations will not allow time for detailed planning. Event and DSTs are the result of detailed intelligence planning that can be accomplished during static periods. They are the basis for all tactical planning and provide the filters through which all information and intelligence are directed to the commander. They satisfy the commander's needs, as expressed in PIRs and IRs, because they are keyed to important battlefield events and the time and space factors that are known to be of interest to the commander. The DST is the vital link between the commander's intelligence needs and the decisions and actions required of the commander and staff.

The commander is vitally concerned with wresting the initiative from the enemy; that is, forcing the enemy commander to choose a less desirable course of action through design rather than through chance. The DST frames the commander's opportunities and options and ensures timely and accurate decisions, thus providing the means to influence enemy actions rather than just react to them.

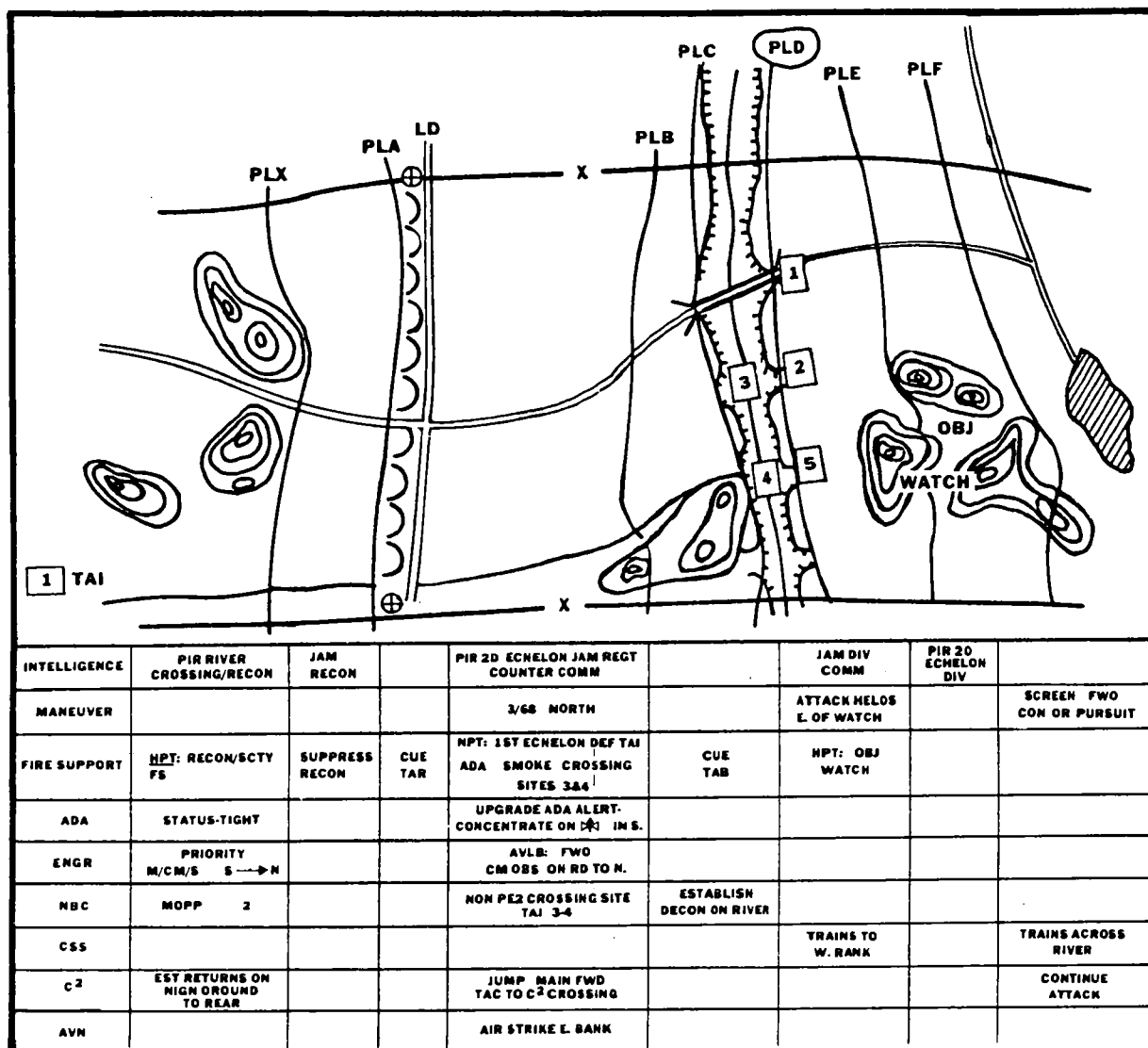


Figure 4-46. Example of a DST keyed to an operational factors matrix.

CHAPTER 5

INTELLIGENCE PREPARATION OF THE BATTLEFIELD SUPPORT

The outcome of battle is decided by the application of combat power at decisive times and places on the battlefield. IPB provides a framework for the commander and staff for determining where and when to employ limited resources to achieve decisive results. It is an excellent tool for planning deep, close-in, and rear operations and for airspace analysis.

COMBINED ARMS TEAM

IPB is especially useful as a tool in planning for deep operations. Threat evaluation identifies critical enemy nodes and HVTs. Event and decision support templating identifies the optimum time to interdict enemy forces in such a manner to achieve the maximum delay, destruction, and disruption, and where and when to decisively exploit identified weaknesses. It facilitates the identification and location of deep targets in time to strike them at the optimum place, and in a manner which constrains and causes the collapse of close-in enemy forces.

IPB provides a guide for the allocation and employment of combat power in close operations. Event templating identifies where the enemy can mass forces and make the thrust when attacking, and where the enemy will concentrate forces when defending. Terrain analysis, weather analysis, and templating techniques assist us in determining where our own forces can move, shoot, and communicate, and where we can best deploy our strength against enemy weaknesses. Event templating facilitates the tracking of enemy forces and assists in determining their probable course of action. Event templating also assists in planning for the employment of limited collection and R&S assets. Decision support templating enables commanders to see the battlefield and assists them in deploying fire and maneuver assets in support of the concept of the operation.

IPB is critical in rear operations. Terrain and weather analysis and threat evaluation assist the rear area commander in effectively placing elements to provide the greatest security consistent with mission accomplishment. Decision support templating, supported by the unconventional warfare SITMAP and the population status overlay, assists rear area commanders in maximizing the effectiveness of air defense, CI, security, PSYOP, and civil affairs efforts. Decision support templating helps rear area commanders make the most effective use of the limited combat assets under their control, and provides a planning guide for requesting and deploying additional assets against any enemy maneuver force which enters the rear area.

IPB also is critical to airspace analysis. Terrain analysis identifies air avenues of approach and mobility corridors, and together

with weather analysis determines the routes by which aircraft can enter an area. When combined with an analysis of aircraft attack profiles terrain analysis determines the most effective aircraft approach routes to the target areas, and the most effective deployment positions for air defense weapons systems and radars. IPB also assists in determining the most likely positions for LZs, DZs, and FARPs and the most likely approaches to these areas. Through terrain masking analysis, IPB assists in determining where aircraft can enter an area screened from air defense weapons and radar, and where air defense radars and weapons are rendered ineffective by terrain and weather. IPB and airspace analysis assists the commander in maximizing the effects of air defense, CAS, and battlefield air interdiction efforts, and in the planning and countering of airborne and air assault operations.

STAFF PLANNING

IPB is an essential part of staff planning. Initially, it is employed by the G2 or S2 to develop intelligence on the enemy, weather, and terrain for use by the commander and staff in planning. This intelligence is embodied in the analysis of the AO and the intelligence estimate. While IPB does not totally replace these documents, it does assist in their development. It also converts much of the written material into graphics which can be easily understood, analyzed, and applied to the planning process.

The formal written analysis of the AO is normally prepared at corps and above. At division and below, an abbreviated analysis of the AO is included as part of the intelligence estimate. It provides an analysis of the terrain and weather in the AO and is used by subordinate elements in planning their operations. The weather and terrain analysis which constitutes the heart of the analysis of the AO is accomplished primarily through IPB.

The intelligence estimate is key to the decisionmaking process. IPB presents the estimate in graphic form. This enables the commander and staff to see rather than to visualize where forces can move, shoot, and communicate. It provides a graphic data base for comparing friendly and enemy courses of action. Weather and terrain overlays show where friendly and enemy forces will be constrained by natural and synthetic factors. Just as the G2 or S2 uses templating to determine probable enemy courses of action, the G3 or S3 uses templating techniques to compare friendly courses of action.

IPB tells the G2 or S2--

- Where to look.
- When to look.
- What to look for.

- What to look with.
- What to expect to see.

IPB tells the G3 or S3--

- Where to maneuver, shoot, jam, and communicate.
- When to maneuver, shoot, jam, and communicate.
- What to maneuver, shoot, jam, and communicate with.
- What to maneuver, shoot, and jam against.
- What results to expect.

IPB is vital to the command estimate and tactical decisions regarding the concept of the operation. It aids in the accurate comparison of friendly and enemy capabilities and enables the commander to see friendly and enemy vulnerabilities. It helps to determine where, when, and how to deploy and support forces to ensure success.

IPB impacts on almost every battlefield function. Just as we analyze the effects of the battlefield environment on enemy capabilities, we also analyze the effects on our own operations. The weather and terrain data base and the event template and event analysis matrix are important tools for the planning and execution of CS and CSS operations. IPB support of battlefield functions is shown in Figure 5-1.

SITUATION DEVELOPMENT

IPB provides the basis for collection and R&S operations. DSTs, together with the commander's concept of the operation, suggest intelligence requirements. Event templates assist the collection manager or coordinator in determining where and when to look for the enemy and for what enemy unit and activities to look. They also provide clues on how to employ the optimum mix of collection assets or sensors. The terrain and weather data bases guide the collection manager or coordinator in deploying assets in a manner that optimizes their capabilities and balances their output.

Through the use of IPB products and analysis, the commander is kept informed of the current and projected situation in a timely, continuous manner. Doctrinal and situation templates provide the basis for comparing collected information to determine the size, composition, and capabilities of located enemy units. They also assist in determining where gaps in our knowledge of the enemy exist. Event templates provide a comparative data base for projecting enemy movements, action, and objectives.

FUNCTIONAL AREA	USE	PRODUCTS USED
Artillery	Target Acquisition Target Value Analysis Weapons Emplacement Deep Attack	Weather and Terrain Overlays Event Analysis Matrix and Template Doctrinal Templates
Air Defense	Enemy Air Avenues of Approach Weapons Emplacement Enemy Air Threat	Weather and Terrain Overlays Doctrinal Templates Event Analysis Matrix and Templates
Engineer	Barrier Planning Route Improvements Route Reconnaissance	Weather and Terrain Overlays Event Analysis Matrix and Templates
Communications	Communications Site Selection ECCM Planning Countersurveillance Planning	Weather and Terrain Overlays Event Analysis Matrix and Templates
Logistics	Installation Site Selection LOC	Weather and Terrain Overlays
Chemical	Fallout Predictions NBC Operations Smoke Operations	Weather and Terrain Overlays
OPSEC	Enemy Collection Capabilities	Weather and Terrain Overlays Event Analysis Matrix and Overlays
IEW Collection Reconnaissance and Surveillance	Planning and Coordination	Weather and Terrain Overlays Situation Templates Event Analysis Matrix and Templates
Army Aviation	Target Acquisition Target Tracking Target Value Analysis	Weather and Terrain Overlays Event Templates Event Analysis Matrix Doctrinal Templates

Figure 5-1. IPB support to battlefield functions.

The IPB process supports the timely identification and attack of HPTs. TVA establishes the relative value of HVTs in various situations. Once the most likely enemy courses of action have been identified, TVA provides a list of HVTs that, if attacked, would degrade the enemy's ability to continue their present operation. This list of targets cues collectors to provide timely identification and locations. At the same time, it cues the FSE to interdict these targets when they are reported, and before they can join the close-in operations. The intelligence staff and the FSE must exchange information on NAIs, TAIs, and attack capabilities. When accomplished, this coordination results in the successful interdiction of the enemy's second echelon and follow-on forces.

ELECTRONIC WARFARE

The EW process might be viewed as one aspect of command, control, and communications countermeasures (C³CM). While the object of IPB is the early identification of probable enemy courses of action, EW planning goes beyond that to develop the most effective mix of OPSEC, military deception, and jamming and destruction options to defeat the enemy's C³.

Like the intelligence analyst, the signals intelligence (SIGINT) or EW analyst uses templates to illustrate enemy capabilities to employ electronic systems for C³, R&S, target acquisition, and radio electronic combat (REC). Templates also aid in the selection and employment of friendly sensors and EW assets. Templates are not produced separately by all-source and EW analysts, but are developed through an integrated ASPS or EW section effort. They are then forwarded to the MI battalion or EAC technical control and analysis element (TCAE) where they are refined, and more detail added to meet the specialized requirements of SIGINT or EW tasking and control.

The following appendixes discuss additional aspects of IPB:

- Appendix A - Tactical IPB
- Appendix B - IPB in the urban battle.
- Appendix C - IPB in air defense, counterair, and air operations.
- Appendix D - Operational level of war IPB.
- Appendix E - IPB in counterinsurgency operations.
- Appendix F - Electronic preparation of the battlefield.
- Appendix G - IPB in the rear operations and rear area operations.

BATTLEFIELD DECEPTION

Battlefield deception is one component of C³CM strategies adopted by commanders to facilitate the application of friendly combat power at decisive times and places on the battlefield.

The IPB effort, and the templates developed during the IPB process, provide the data required by deception planners to determine deception targets, objectives, stories, plans, and events. IPB provides an excellent tool for graphically revealing where and when the employment of deception will provide the optimal operational utility for achieving the friendly mission.

Deception planners use IPB templates to identify and locate those enemy R&S, target acquisition, and REC systems over which the deception story is portrayed to the deception target. Templating also aids in the site selection of deception events, thus ensuring that they have a reasonable probability of being received and reported by the enemy's intelligence collection assets.

IPB is especially useful in determining--

- Who (personally or doctrinally) the deception target should be.
- The type of enemy action or inaction required (the deception objective) which provides the most or best potential to operationally exploit by fire, maneuver, or EW means.
- Whether or not the enemy will be able to adopt the deception objective within the timeframe which is operationally relevant to the friendly mission. This information is based on the enemy's doctrinal requirements, and the weather and terrain constraints.
- The types of deception events that have the best potential for plausibly portraying the deception story to the enemy's collection means and the appropriate enemy decisionmakers.
- The PIRs and IRs needed to successfully support and execute the deception planning and evaluation functions.
- The deception course of action the enemy is most likely to regard as being authentic or plausible.

CHAPTER 6

INTELLIGENCE PREPARATION OF THE BATTLEFIELD--THE SYSTEMATIC APPROACH

IPB is not new. Commanders have always analyzed the enemy, weather, and terrain and have always used graphics (the SITMAP) to communicate intelligence and combat information. However, prior to IPB they did not have a systematic, continuous approach to analyzing the enemy, weather, and terrain for specific geographic areas. Never before have commanders used graphics to predict enemy intentions, to plan and support friendly decisions, or to support the myriad functions essential to success in battle.

IPB is labor-intensive, but it is well worth the effort. It will increase the timeliness and accuracy of intelligence and combat information. It will not ensure success on the battlefield, but it will provide the commander with superior intelligence products on which to base decisions.

IPB provides a tool to assist commanders in accomplishing their missions on the battlefield. It is a systematic and continuous approach to analyzing the enemy, weather, and terrain to determine enemy capabilities, vulnerabilities, and probable courses of action for a specific geographic area. Commanders use IPB as a basis for fire and maneuver decisionmaking. Combat support and CSS commanders use it for planning, and it is especially useful in IEW operations. IPB enhances IEW support to OPSEC, SITDEV, and C³CM.



APPENDIX A

TACTICAL INTELLIGENCE PREPARATION OF THE BATTLEFIELD

Initially, the IPB process focused on defensive operations. However, as the modern battlefield became more dynamic and the focus of friendly operations shifted to the AirLand Battle concept, the requirement for IPB to support offensive operations has grown.

INTELLIGENCE PREPARATION OF THE BATTLEFIELD IN OFFENSIVE OPERATIONS

Offensive IPB is the process by which uncertainties regarding the enemy's withdrawal routes, defensive posture, defensive weapons systems, and counterattack and reinforcement options can be reduced. Offensive IPB is not limited to assisting commanders in employing their assets in the most effective manner. It also allows the analyst to think like enemy commanders to determine where they could employ assets in support of their defensive operations. It helps determine which friendly assets the enemy would consider to be HVTs, and points to potential gaps in the enemy's knowledge of friendly forces and operations that can be exploited. Finally, offensive IPB assists the analyst in determining potential enemy counterattack and reinforcement routes and options, and in establishing NAIs, TAIs, and DPs to reduce the potential effects of the enemy's counterattack or reinforcement efforts.

Offensive IPB has a wider scope and a somewhat different focus than traditional defensive IPB. However, the normal IPB functions of battlefield area evaluation, terrain analysis, weather analysis, threat evaluation, and threat integration remain the same. For offensive IPB, the difference is the battlefield area and threat evaluation, and the threat integration functions have been expanded significantly.

It is critical that the basics of offensive IPB planning be completed prior to the onset of actual combat. The current situation dictates that friendly forces will probably begin any future mid- to high-intensity conflict on the defensive. Therefore, the initial offensive IPB effort will probably be conducted in support of limited counterattacks against localized objectives. IPB efforts in support of large-scale offensive operations will begin only after the enemy's main thrust has been blunted and the initiative has passed to friendly forces. As defensive IPB efforts will assume first priority during the initial stages of operations, the availability of a well-developed offensive IPB, based on contingency analysis, will be critical when the window of opportunity opens for friendly forces.

As with other IPB operations, the G2 or S2 serves as the offensive IPB coordinator and ensures that the commander's PIRs are satisfied in accordance with the guidance received. It is critical that an accurate threat data base be prepared to support offensive operations. Without this data base, it is unlikely that a friendly commander will be able to generate a superior force ratio at the decisive point on the battlefield.

It is critical also to identify specific enemy weakness to assist the commander in properly concentrating available assets.

BATTLEFIELD AREA EVALUATION

The offensive battlefield area evaluation process begins with the offensive mission, to include the specific mission objectives. It assesses the overall nature of the defending enemy, the capability of friendly forces to conduct offensive operations, and the battlefield environment. It calls attention to significant areas and features which will affect withdrawal, attack, counterattack, and reinforcement operations and calls attention to significant areas which enemy commanders will consider critical to their defensive effort.

The offensive battlefield includes both the AO and the AI. However, during offensive operations, the ground AO is expanded to include the command's axis of advance or direction of attack and the designated friendly objectives in enemy-held territory.

The offensive AO is continually expanding as friendly forces maintain contact with the withdrawing enemy. The limits of the offensive AO normally reach to and include the entire friendly objective.

The offensive air AO is identical to the ground AO and expands with the ground AO. The principal difference between the ground and air offensive AO is that the air AO extends beyond the friendly objective to areas where a withdrawing enemy could be expected to reorganize or reform, or where second-echelon of follow-on counterattacking or reinforcing forces could be expected to appear. The air AO also extends outside the friendly boundaries to areas through which withdrawing, counterattacking, or reinforcing forces could be expected to move.

The offensive AI is necessarily much larger than during defensive operations. As an attacking force approaches or penetrates the deep operations areas, commanders must be aware of the increasing potential for tank-heavy counterattacks directed against their flanks or at unit boundaries. Commanders must also be aware of the potential for possible enemy reinforcements on or beyond the objective, or the potential for an enemy counterattack to prevent consolidation on the objective.

The offensive air AI is considerably larger than the ground AI and, like the ground AI, must expand with friendly forward movement. However, the air AI must extend deeper into the friendly and enemy rear areas due to the rapid potential effects of air operations on offensive and defensive sustainability.

TERRAIN ANALYSIS

Offensive terrain analysis focuses on the potential influence of the terrain on friendly and enemy maneuverability. Each of these areas is examined with regard to the five military aspects of terrain.

Observation

Observation is evaluated by its influence on friendly and enemy R&S and target acquisition capabilities. The terrain analyst seeks conditions that maximize friendly LOS-dependent operations while denying these same capabilities to the defending enemy. By determining the effects of the terrain on LOS, the analyst is able to determine the probable locations of enemy direct-fire weapons, observation posts (OPs), communications sites, EW assets, air defense units, and target acquisition systems. Observation is also evaluated with respect to its effect on the enemy's counterattack potential. The primary consideration is placing assets in a position to acquire the enemy counterattacking or reinforcing force while the commander still has time to react.

Fields of Fire

FofF are evaluated from the perspective of both the effectiveness of friendly direct and indirect fires on the defending enemy and the effects of these fires on advancing friendly forces. Special consideration must be given to FofF for enemy direct fire weapons, such as tank main guns, as these weapons will likely be dug in or concealed in hull-down positions.

The evaluation of observation and FofF will assist the analyst in identifying key terrain for both friendly and enemy forces.

Concealment and Cover

Concealment and cover are major factors in offensive operations. Concealment is evaluated on the basis of its potential effects on friendly operational security and on deception operations conducted in support of the attack. Enemy defenders will attempt to use concealment to prevent or restrict R&S of their positions and to cover preparations for counterattacks. The enemy can be expected to enhance natural concealment through the use of natural or artificial camouflage while in the defense. Although determining requirements for the employment of camouflage is not normally considered part of the terrain analysis process, it is critical to consider the ability of the terrain to adequately conceal enemy defensive operations and positions. Cover must be evaluated from the perspective of its effects on the friendly advance, and by its contribution to the enemy's defensive posture. The enemy's capability to enhance natural or to create artificial cover, such as defensive earthworks, also must be considered.

Obstacles and Key Terrain

Obstacles and key terrain are not evaluated differently during offensive operations. Obstacles, whether natural or synthetic, are obstacles to both enemy and friendly forces. Key terrain remains key only if it can be controlled through fire, maneuver, or jamming, and offers a marked advantage to one force or the other. The accomplishment of the friendly mission will normally require the seizure of decisive terrain.

Air and Ground Avenues of Approach

The analysis of air and ground avenues of approach and mobility corridors is critical to offensive operations. The ground avenue of approach should be broad enough to support rapid friendly movement and maneuver along its course. Concealment and cover are important, especially if the attacking force must operate in an air parity or inferiority situation. Obstacles must be reducible without special engineer support, or bypassable within mission time constraints. Mobility corridors should provide the friendly commander with the ability to maneuver freely, and should maximize the potential for mass, momentum, shock, and speed. The ground avenues of approach and mobility corridors into an objective are often the same routes the enemy must take during retrograde operations.

Air avenues of approach and mobility corridors permit the employment of aerial sensors, rotary and fixed-wing CAS, battlefield air interdiction, and airborne or air assault assets. A good air avenue of approach provides terrain masking of aircraft from enemy air defense assets. Air avenues of approach and their considerations must be continued beyond the objective to allow friendly aircraft to safely exit the area. In addition, analysis of enemy air avenues of approach will aid in determining where and when enemy air will be employed.

The analyst must also consider avenues of approach and mobility corridors which support enemy counterattack or reinforcement efforts. This includes avenues of approach which would normally be outside the AO or AI. Counterattack avenues or corridors which allow access to the attacking unit's flanks, or which allow the counterattacking force to prevent consolidation on the objective should receive priority consideration.

WEATHER ANALYSIS

Weather analysis in support of offensive operations does not differ significantly from that of other operations. The analyst must still consider the aspects of visibility, wind speed and direction, precipitation, cloud cover, and temperature and humidity.

Reduced or limited visibility benefits the offense by concealing friendly force concentrations and enhancing the potential for achieving surprise. The same reduced visibility hinders the enemy's withdrawal and defense by increasing control problems and impeding R&S and target acquisition. The attacking force may desire to reduce visibility through the use of smoke in order to cover massing of forces and the actual location of the attack, or for deception.

Wind speed and direction impact on offensive operations and favor the upwind force. The upwind force has better visibility and can advance easier and faster, as well as being in a better position to employ nuclear and chemical weapons. The upwind force's indirect fire weapons will normally be more accurate. Strong winds limit the employment of airborne

and air assault forces and have an adverse effect on the accuracy of CAS, especially CAS by rotary-wing aircraft. These situations are normally reversed if the friendly force must attack upwind, and is especially critical if the enemy is able to force the attacking units into a high level of MOPP. Wear of MOPP gear limits individual mobility and reduces the effectiveness of optical sights and direct fire weapons. Upwind attacks normally cause vehicles to generate larger dust plumes, force R&S assets to restrict movement, and reduce the potential for surprise.

The primary significance of precipitation is its effects on offensive trafficability and visibility. While rain and snow will limit visibility and conceal friendly maneuver, they will also degrade trafficability and slow offensive operations. Trafficability, reduced by rain or snow, limits deep operations and maneuver by armored and mechanized units. Poor trafficability increases fuel consumption and reduces vehicle range. It can also limit or prevent refueling or resupply operations by preventing wheeled resupply vehicles from reaching forward refueling and resupply points. Rain and melting snow leeches chemical and nuclear contamination from the soil, creating hot spots of contamination, especially in low-lying areas. These hot spots affect operations in the same manner as directly employed chemical or nuclear weapons. Precipitation will also degrade and slow the enemy's withdrawal and will have an adverse impact on enemy counterattack and reinforcement operations.

There are no significant differences in the consideration of cloud cover and temperature and humidity between offensive and other operations. Low cloud cover restricts CAS which may be critical to offensive operations and may restrict the use of laser devices due to the enhanced potential for detection. High temperatures during a fast-moving offensive can be expected to increase the potential for heat-related injuries, especially if the attacking or counterattacking elements are forced to maneuver in heavy protective clothing.

THREAT EVALUATION

During offensive operations, threat evaluation focuses on enemy doctrine for retrograde, delaying, defensive, counterattack, and reinforcement operations. Doctrinal templates for each of these operations are prepared during this function.

Soviet doctrine (the basis for most other potential threat doctrine) stresses offensive operations, but recognizes the need to conduct defensive operations in certain situations--

- ° To consolidate the gains of advance elements.
- ° To await additional resources when temporarily halted by the enemy during the course of an offensive.
- ° To protect the flanks of a formation or along a seacoast.

- To repulse an enemy counterthrust.
- To regroup after severe losses suffered from weapons of mass destruction (nuclear and chemical weapons).
- To free resources for other elements of the formation which are on the offensive.
- To await logistic support.

In most of these cases, the defense is clearly temporary and will lead to the resumption of the offense.

Soviet doctrine recognizes three defensive operations: the prepared defense, the hasty defense, and the withdrawal. All three operations ultimately stress the resumption of the offense or the reallocation of forces to strengthen other, more successful sectors. However, the Soviets do realize that conditions may not always favor the resumption of the offense and that both the withdrawal and the hasty defense may ultimately turn into a prepared defense under certain conditions.

The establishment of a prepared defense is dictated by the same factors of METT-T that must be considered by a friendly commander. When establishing a prepared defense, the enemy will concentrate on the following. Figure A-1 shows the overall alignment of a prepared defense.

- The deployment and employment of a security echelon.
- The location and deployment of forces in the main defensive area.
- The location of fire sacks, killing zones, and ambush sites.
- The construction of minefields and barriers both in the security echelon area and the main defensive area.
- The location, composition, and employment of the reserve counterattack or reinforcing force.

The security force will employ maneuver, mines, and barriers on the best terrain to delay the enemy, strip the infantry of tank support, deceive the enemy as to the location of the main defensive area, and cause premature deployment. The strength of the main defensive area is concentrated in mutually supporting company (platoon) defensive positions which are well dug in and connected by trenches. Extensive dummy positions are constructed to deceive the enemy and dug-in wire communication links are emplaced as the primary means of communication. Fires are planned to cover all enemy approaches and minefields and barriers are emplaced to channel the enemy into fire sacks where all weapons can be brought to bear. All positions are camouflaged. Reserves are positioned to perform counterattacking, reinforcing, blocking, and to effect rear area security missions. Figure A-2 shows a doctrinal

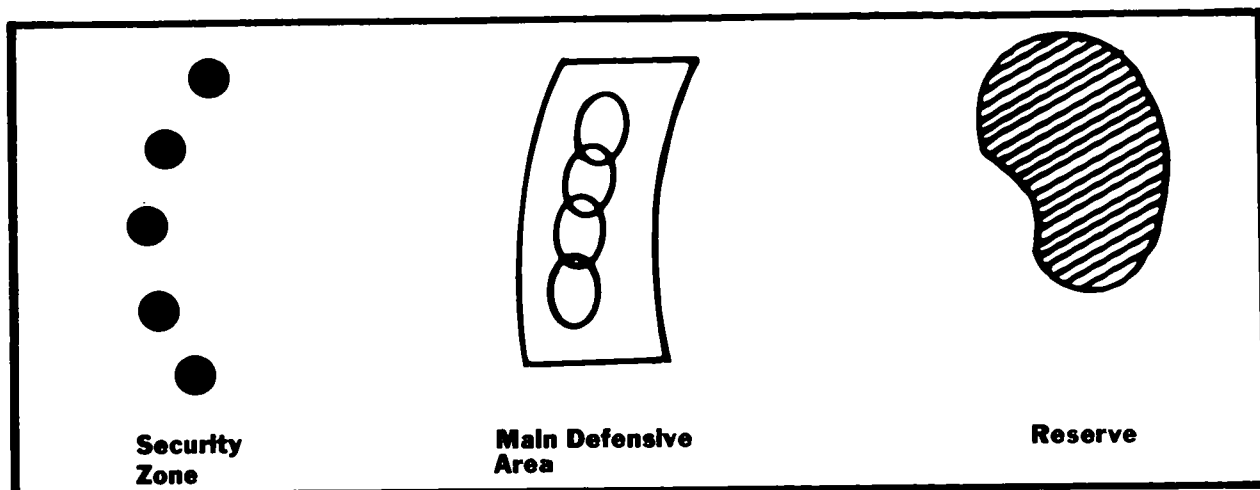


Figure A-1. Overall alignment of a prepared defense.

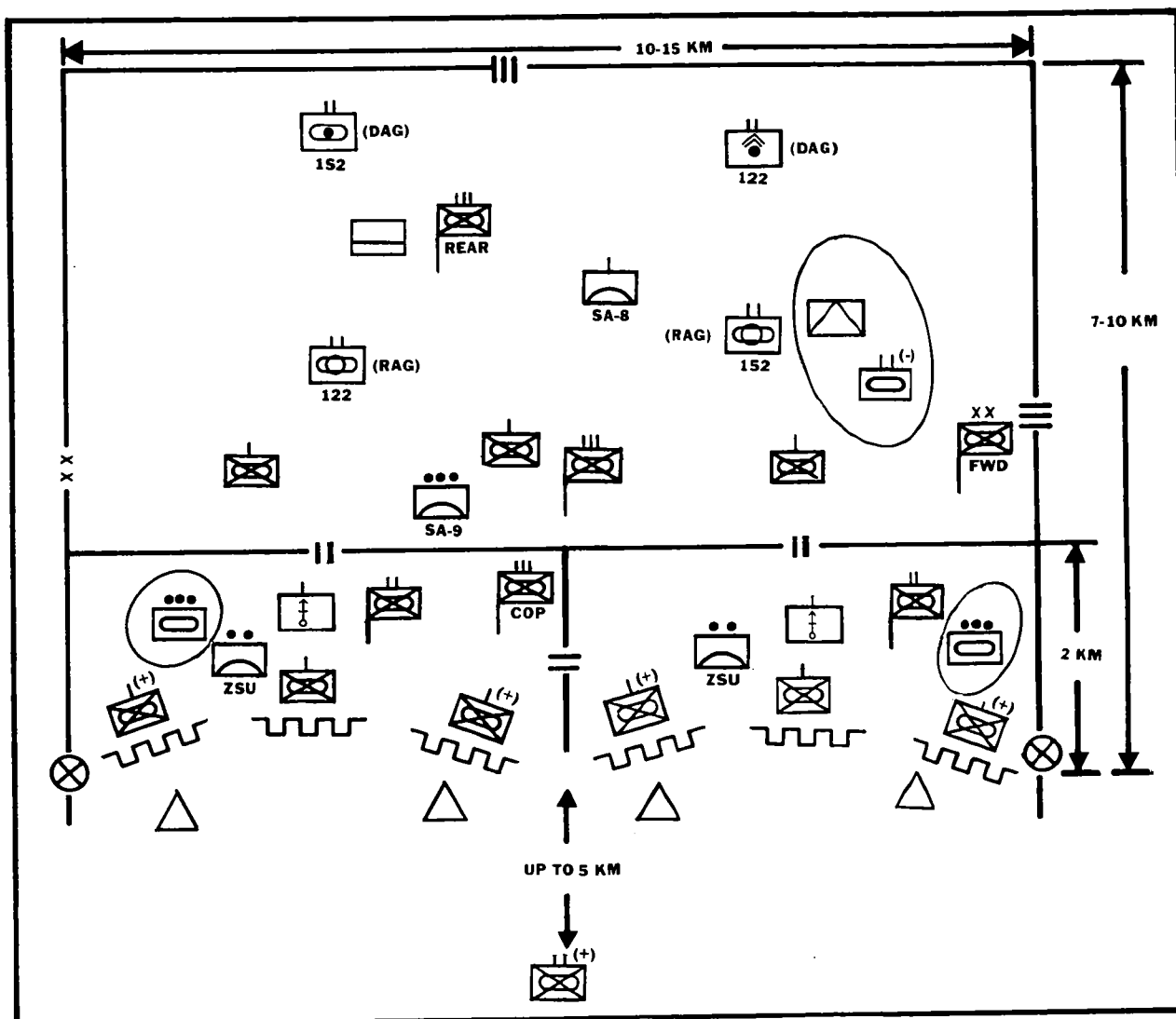


Figure A-2. Doctrinal defense for an MRR with a tank battalion in reserve and security elements in place.

defense for an MRR with the tank battalion in reserve and the security elements in place.

Additionally, the regimental reconnaissance company and the division reconnaissance battalion will form a screen out to the limits of the division security zone (up to 15 kilometers). The security element will normally be provided by the division's second echelon MRR and will normally operate up to 5 kilometers forward of the main defensive area.

The defense in the course of the offense (hasty defense) is based on the same METT-T factors as the prepared defense. However, it normally differs in that--

- The mission of the defense is more transitory.
- The enemy situation is clearer.
- Attack or counterattack is more imminent.
- The terrain may be unsuitable for defense and may even favor the attacker.
- Time may be short.

As the establishment of a hasty defense requires the transition from offense to defense while in contact with the enemy, a series of short, localized actions may be required to gain defensible terrain; or it may be necessary to establish a defense to the rear and withdraw to the defensive line.

Since the force going over to the defense will frequently be in contact with the enemy, the establishment of security forces is normally not possible. If security forces are established, their depth will not be as great as in the prepared defense. Long-range fires will not play as great a part as in the prepared defense as the threat will be within small arms range. Barriers and minefields will be deployed in depth, when possible, but will not be as extensive as in the prepared defense.

Normally, denial of enemy access to a specific area is the primary objective of a hasty defense. Therefore, defensive positions are often chosen for their ability to support the resumption of offensive action rather than the attrition of the enemy over a prolonged period. Combat support will normally remain configured for continued offensive action, and artillery will be task-organized to support the next offensive phase.

Withdrawals are carried out to relocate a force from one position to another in a timely, organized fashion without sacrificing the combat capability of the unit. Withdrawals are conducted only on the order of the superior commander and under conditions of the strictest secrecy and security when possible.

Withdrawing forces are divided into three specific groups. The main force is the bulk of the force to be withdrawn. Its mission is to disengage and withdraw without disclosing the operation to the enemy. The rear guard is the force designated to cover the movement from one location to another and to delay the enemy if the enemy attempts pursuit. The covering force is the element which is left in position to deceive the enemy and to cover the initial disengagement and withdrawal. Figure A-3 shows the organization for withdrawal (regimental and higher echelons).

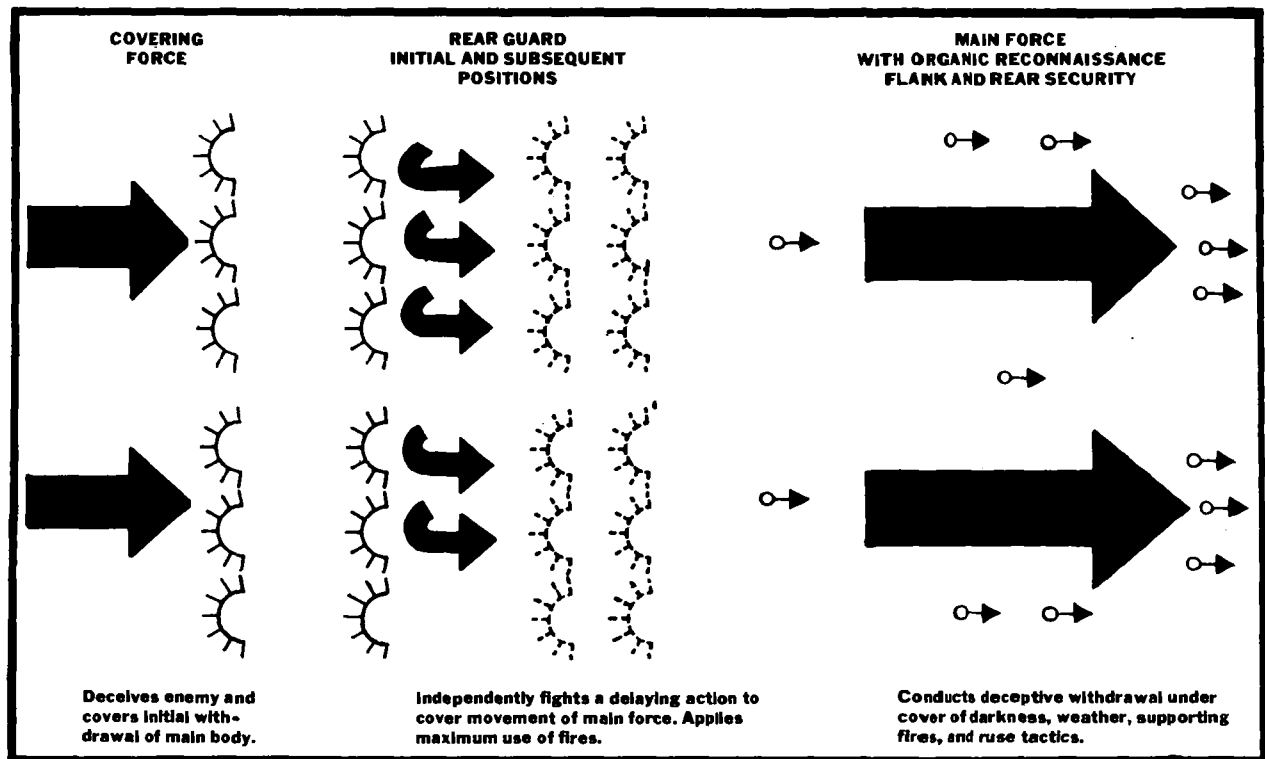


Figure A-3. Organization for withdrawal (regimental and higher echelons).

The covering force normally comes from the forces along the forward edge of the defense. This force usually consists of a reinforced platoon from each company, supported by selected artillery units. The covering force begins its withdrawal once the main force has withdrawn through the rear guard, and leapfrogs elements in order to be mutually supporting. The force rejoins the main force when the mission is completed.

The rear guard is organized so that it can delay the enemy without depending upon forces from the main force or the covering force. It normally consists of tank units reinforced with motorized rifle, artillery, and engineer elements. A battalion-sized unit will be assigned to each major route of withdrawal. The rear guard occupies successive defensive positions in such a manner that pursuing enemy forces are forced to pause and reorganize before attacking the next line.

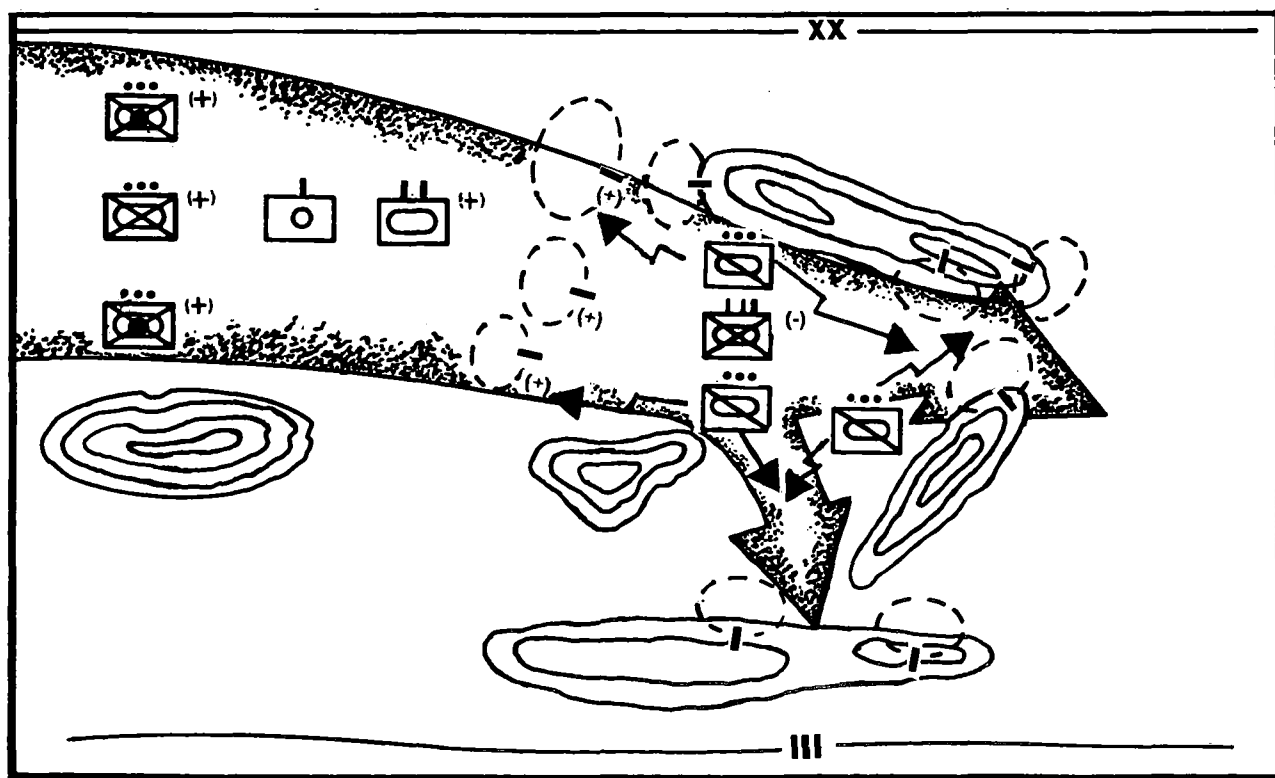


Figure A-4. Enemy withdrawal situation template.

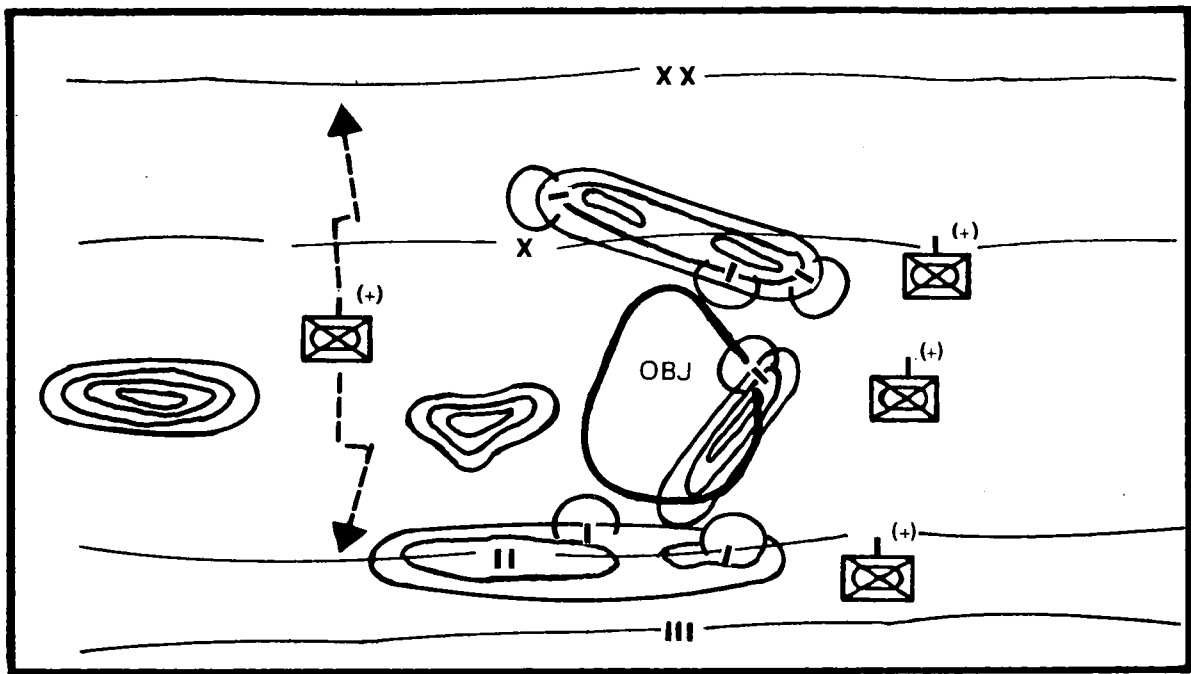


Figure A-5. Enemy defense situation template.

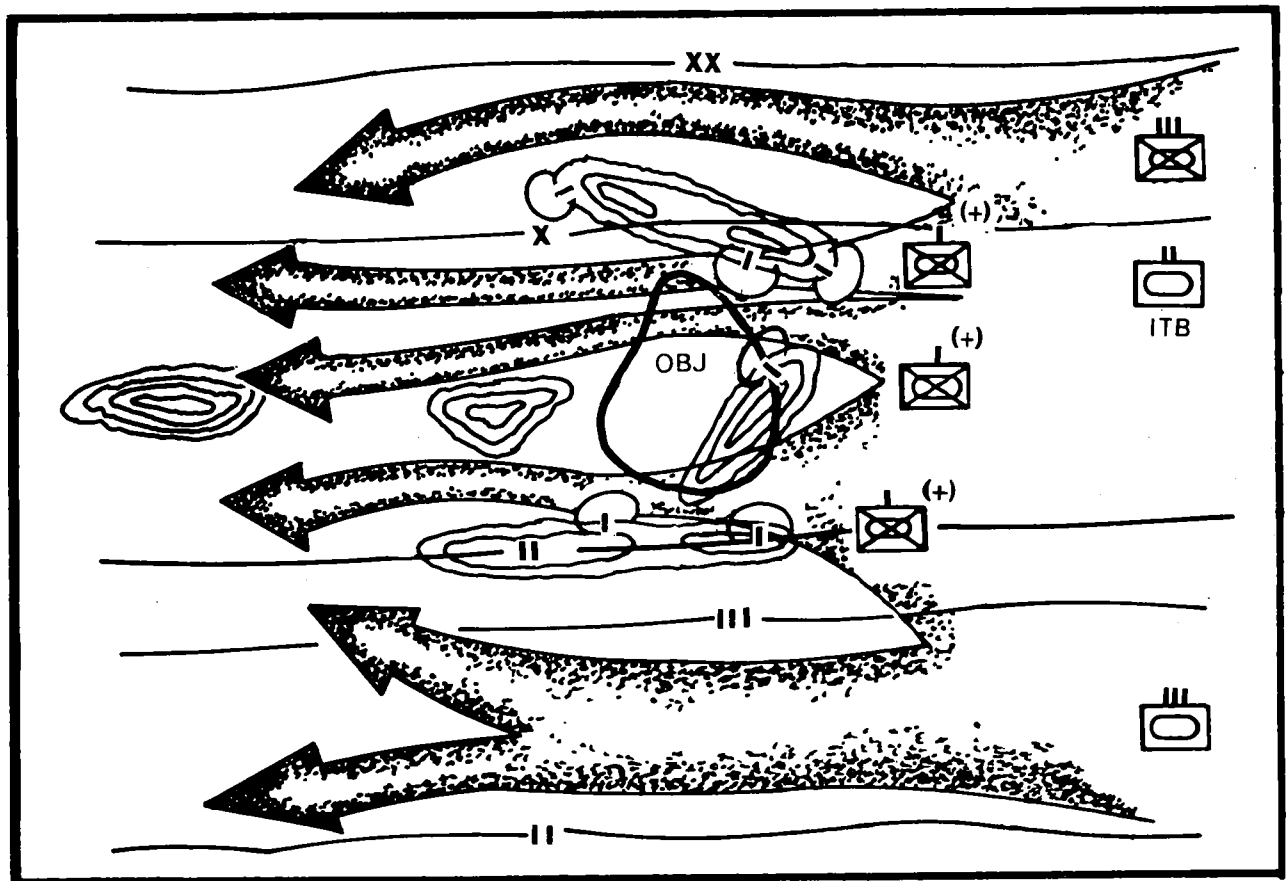


Figure A-6. Enemy counterattack situation template.

In addition to the information normally depicted on the situation template, range fans showing the maximum effective ranges of the enemy's weapons systems, particularly direct fire weapons systems are included on the template. This information may be depicted on the template itself, or on a separate map overlay. While it may be easier to prepare a separate overlay for this information to reduce clutter on the template, overlays make the map and any underlying templates more difficult to read.

A range overlay showing the effective ranges of enemy air defense weapons systems is also prepared, and may or may not include terrain masking information. This is usually prepared as a separate overlay, as it is normally removed when air operations are not being conducted. Regardless of how the information is depicted, a graphic presentation of the enemy's defensive weapons systems is critical to the planning of offensive operations. Figures A-7 and A-8 show enemy defensive and enemy air defense weapons systems range overlays.

The situation template is used to develop the event template. Event templating initially focuses on the enemy's withdrawal, and then shifts to a defensive posture and counterattack or reinforcement routes. When time permits, event templates are prepared for each of these operations. When time is short, the defense and counterattack operations are normally included on the same event template. All event templates are developed to help the G2 or S2 or collection manager deploy specific collection assets, or to assist in determining where and when the enemy will employ collection assets.

The enemy withdrawal event template is concerned with determining how the enemy is withdrawing, and to where the forces are withdrawing. NAIs include specific withdrawal routes, potential and alternate battle positions, and potential deployment areas for reserves. TPLs may be included to assist in tracking the enemy force as it withdraws. However, the utility of TPLs may be limited by the actual duration of the withdrawal. In any case, the initial NAIs should be concerned with determining whether or not the withdrawal has actually begun. Figure A-9 shows an enemy withdrawal event template.

The enemy friendly force event template focuses on friendly rather than on enemy movement and is based on wargaming. It depicts how the enemy commander might view the attacking friendly force, and includes where the enemy could be expected to place NAIs and TPLs. The template serves as a graphic representation of the enemy's collection plan and provides the G3 or S3 and the G2 or S2 with information on where the enemy might be expected to employ collection assets. Figure A-10 shows an enemy friendly force event template.

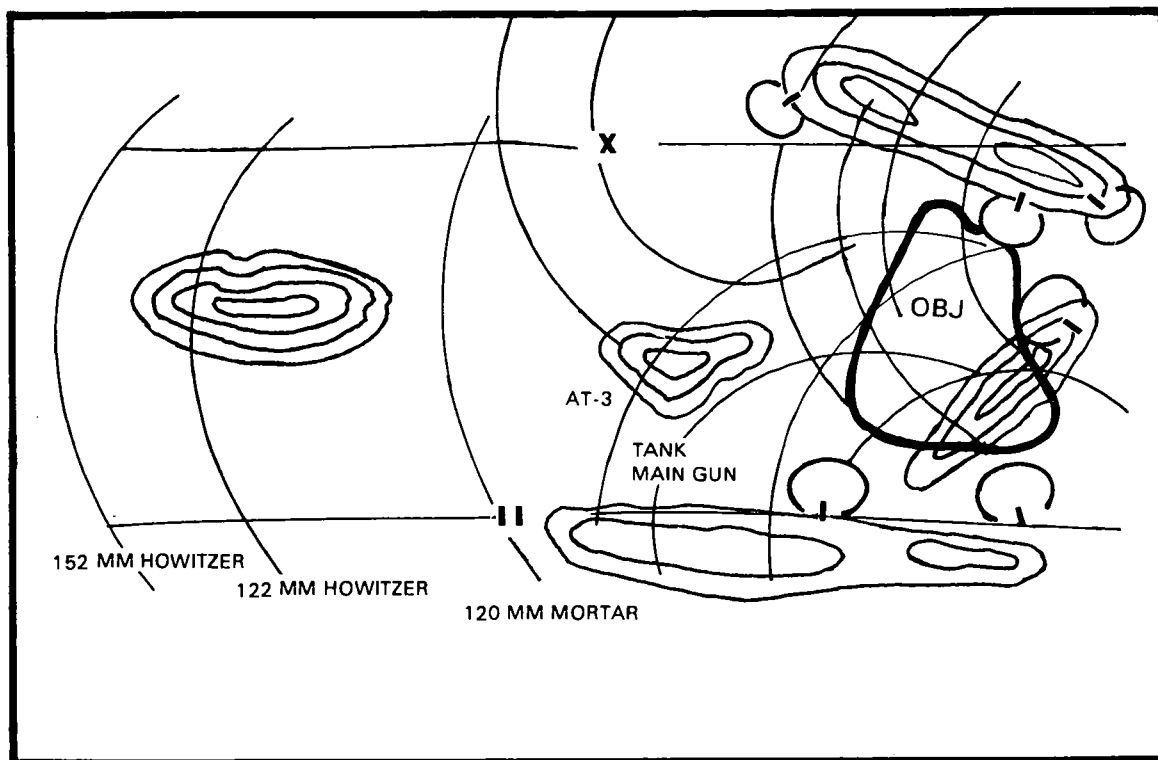


Figure A-7. Enemy defensive weapons systems range overlay.

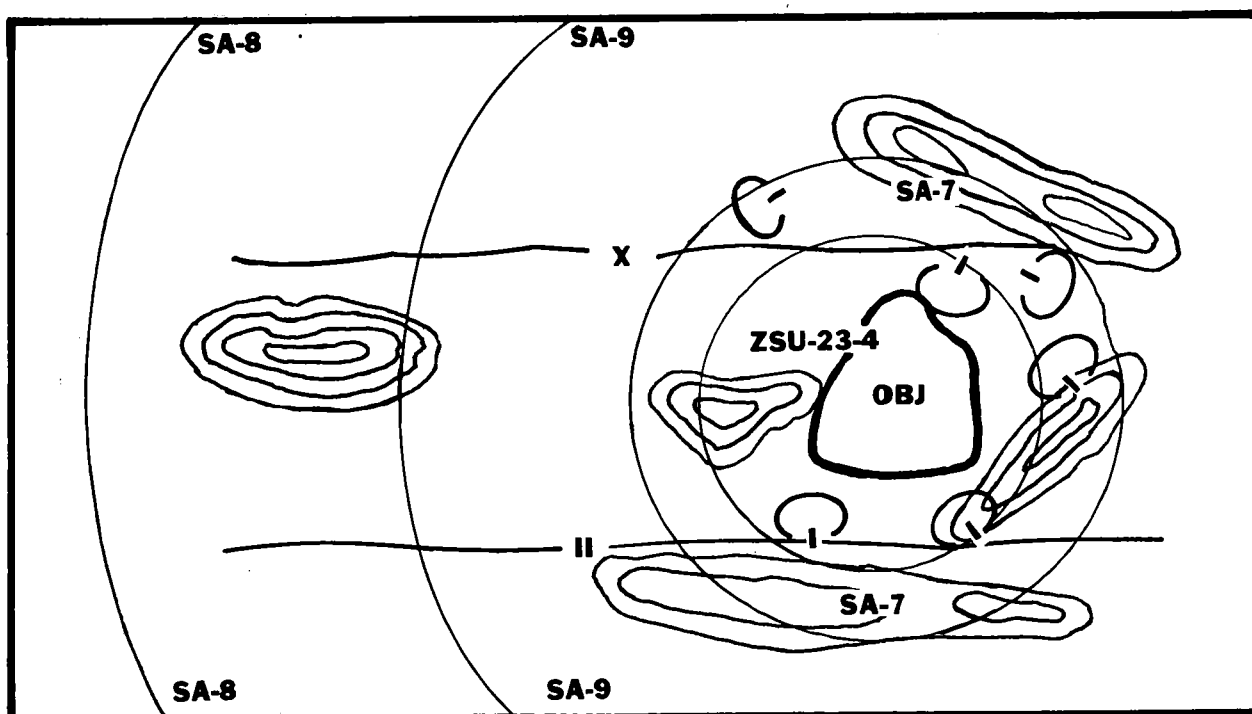


Figure A-8. Enemy air defense weapons systems range overlay.

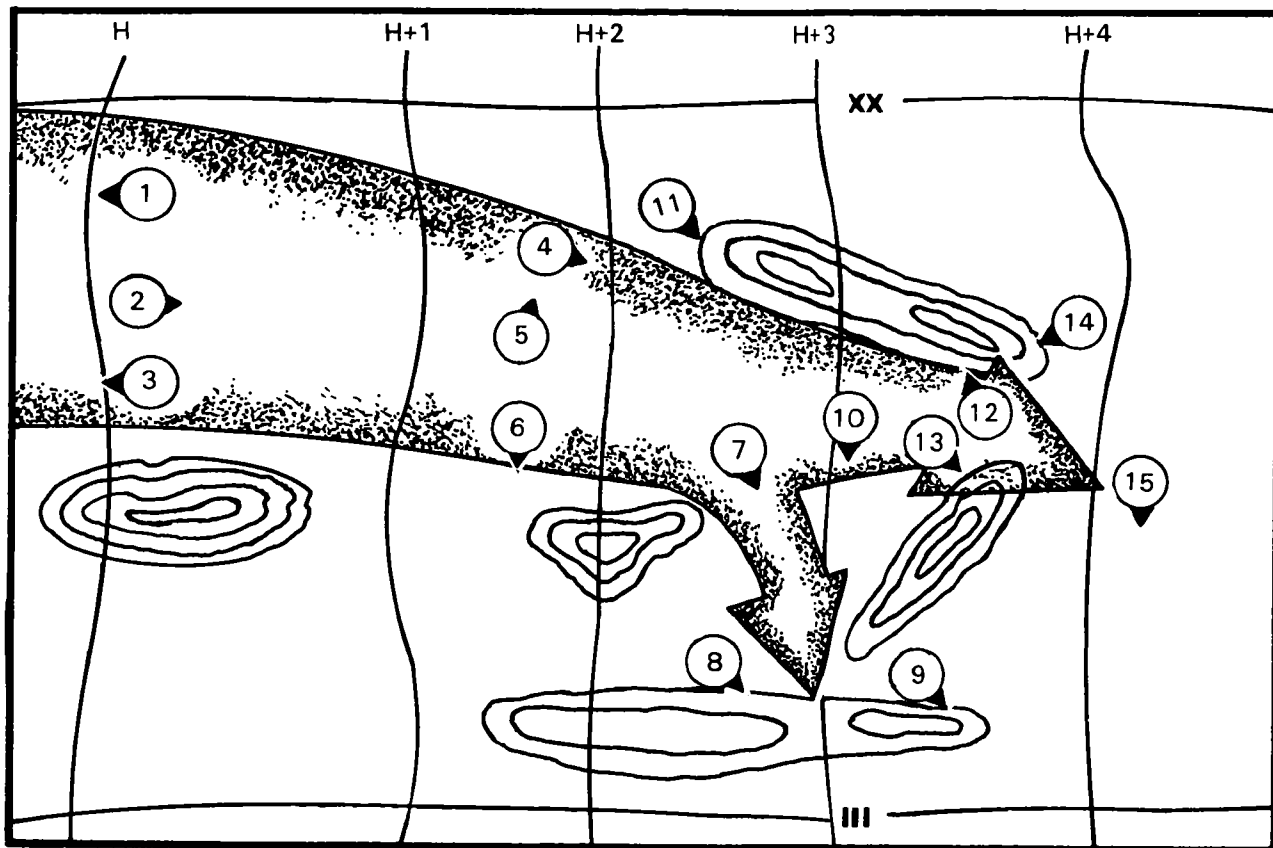


Figure A-9. Enemy withdrawal event template.

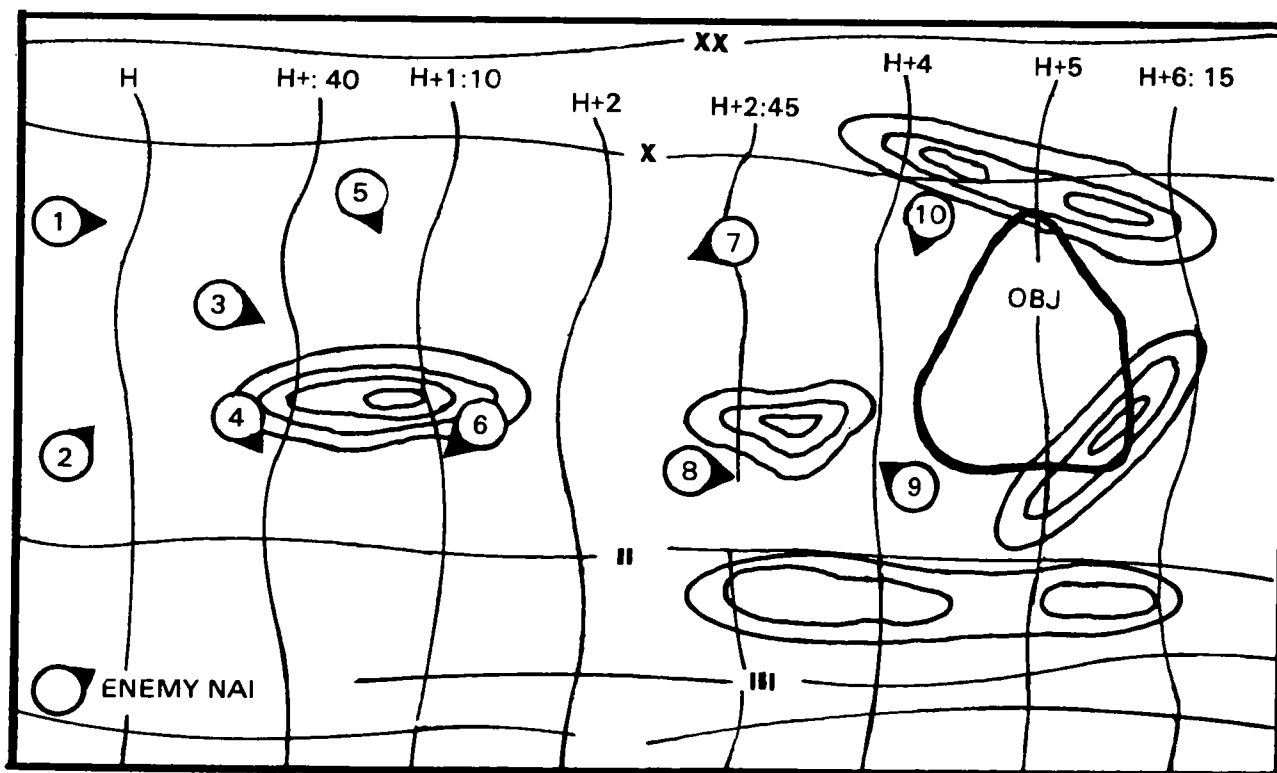


Figure A-10. Enemy friendly force event template.

The enemy counterattack event template as shown in Figure A-11 depicts projected or potential enemy counterattack and reinforcement routes and options. These potential routes are analyzed based on the size of the force that each is capable of supporting and are continued to a point beyond the friendly objective or battle positions (BPs). NAIs are established along each potential route. These focus on areas where the enemy force must appear if its commander has selected a particular route.

Events occurring at NAIs along various routes can be compared to assist the analyst in determining the specific intentions of the counterattacking force. TPLs assist the collection manager in tracking the enemy counterattack or reinforcement effort and in directing collection assets during later phases of the attack and during consolidation on the objective.

An event analysis matrix may be prepared with the withdrawal or counterattack event templates to assist in predicting the arrival times of enemy forces. However, the movement times used in the event analysis will be based on actual encountered movement rates, as there are no doctrinal rates for these operations.

Offensive event templating provides the basis for offensive decision support templating. Offensive decision support templating relates the detail of the offensive event templates to points significant to the commander. As with other type of operations, the DST does not dictate decisions to the commander, but relates critical events to time and locations which may require decisions.

Normally during offensive operations, a single DST is not sufficient to depict all the aspects of the operation and to complete the wargaming process. As many as four DSTs may be required to support the friendly decisionmaking process during the enemy withdrawal, friendly attack and enemy counterattack phases, and to portray the enemy's decisionmaking process. Very rarely will time permit the development of separate templates for the withdrawal, attack, and counterattack phases of an operation. While it is still necessary to wargame each of the individual phases, they are usually portrayed on a single DST or as overlays to the friendly DST. However, it is critical that an enemy DST, or "red DST," be prepared for all offensive operations. This does not mean that a formal red DST must be prepared. However, the G2 or S2 must be aware of where the enemy's critical DPs are located in relation to time and distance, and be prepared to provide the commander with this information.

The enemy withdrawal DST assists the commander in determining when the enemy will begin withdrawal and helps the commander reduce or destroy the enemy's capabilities before the enemy can establish a defense and prepare a counterattack. As the entire object of the withdrawal is to move the force while retaining its combat potential, interdiction will have a

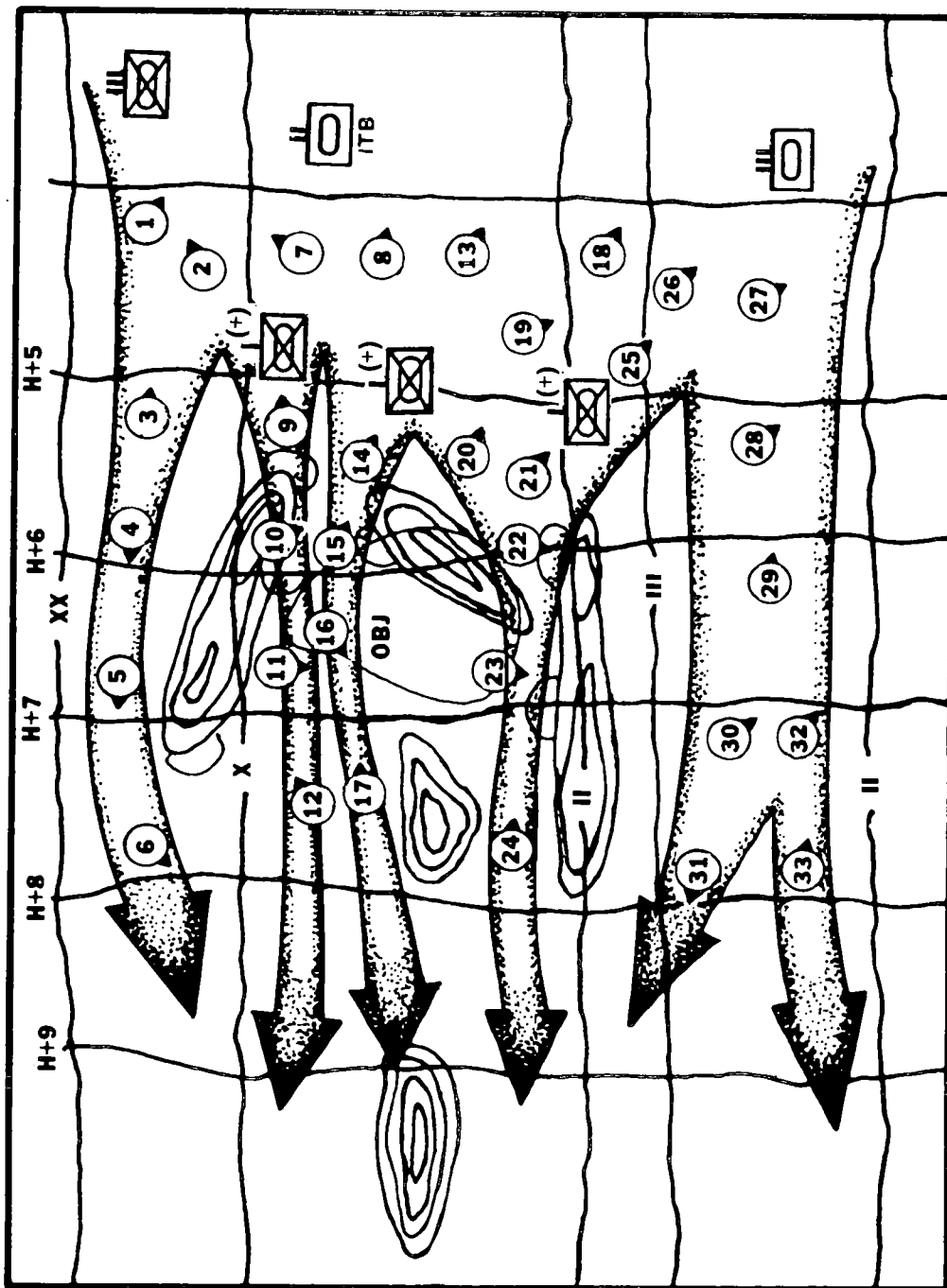


Figure A-11. Enemy counterattack event template.

significant impact on the enemy's future options, including counterattack and reinforcement. The withdrawal DST can often be combined with the attack DST, particularly if pursuit is initiated and the enemy establishes a hasty defense. Figure A-12 shows an enemy withdrawal DST.

The friendly DST provides the commander with a structured basis for deploying fire, maneuver, and jamming assets and for reducing the enemy's defensive capability with these assets. Simply stated, it provides commanders with the specific points on the battlefield where they will be required to make decisions regarding the employment of their assets. These decisions can be keyed to phase lines, events on the ground, or to specific enemy actions. Figure A-13 shows a friendly attack DST.

The enemy defense DST, or red DST, is key to the wargaming effort. It depicts how the enemy commander might view the battlefield and shows potential enemy TAs, DPs, and time phasing. It shows where and when the enemy commander is most likely to employ fire (air, artillery, and tactical ballistic missiles (TBMs)), maneuver, and jamming assets to disrupt, deter, or destroy the friendly attack, and where the enemy will be forced to make critical decisions. The red DST normally includes only the friendly objectives, enemy TAs, DPs, potential time phasing, and the current enemy situation. Figure A-14 shows an example of an enemy defense DST (red DST).

The final DST developed for an offensive operation is the enemy counterattack DST. The counterattack DST is normally prepared as part of, or as an overlay to, the friendly attack DST. It consists of DPs and TAs which assist the commander in deploying assets to reduce or negate the effects of enemy counterstrikes or reinforcement efforts. Often, the initial DP involves the friendly commander's decision to consolidate or establish a hasty defense on the objective. Figure A-15 is an example of friendly DST (enemy counterattack).

DEFENSIVE OPERATIONS

From its inception, IPB was primarily concerned with defensive operations. Although doctrine now dictates that friendly commanders must be more offensive minded, the international situation indicates that we will be forced to begin any major future conflict on the defensive.

Under the AirLand Battle Doctrine, defensive operations are used to delay the enemy and wear down enemy forces to a point where friendly forces can seize the initiative and begin the offensive. Defensive IPB not only assists commanders in predicting where and when the enemy will appear on the battlefield but also assists them in locating and interdicting enemy follow-on forces. The successful interdiction of follow-on forces creates periods of reduced enemy force levels in the close-in operations area. These periods are described as windows of

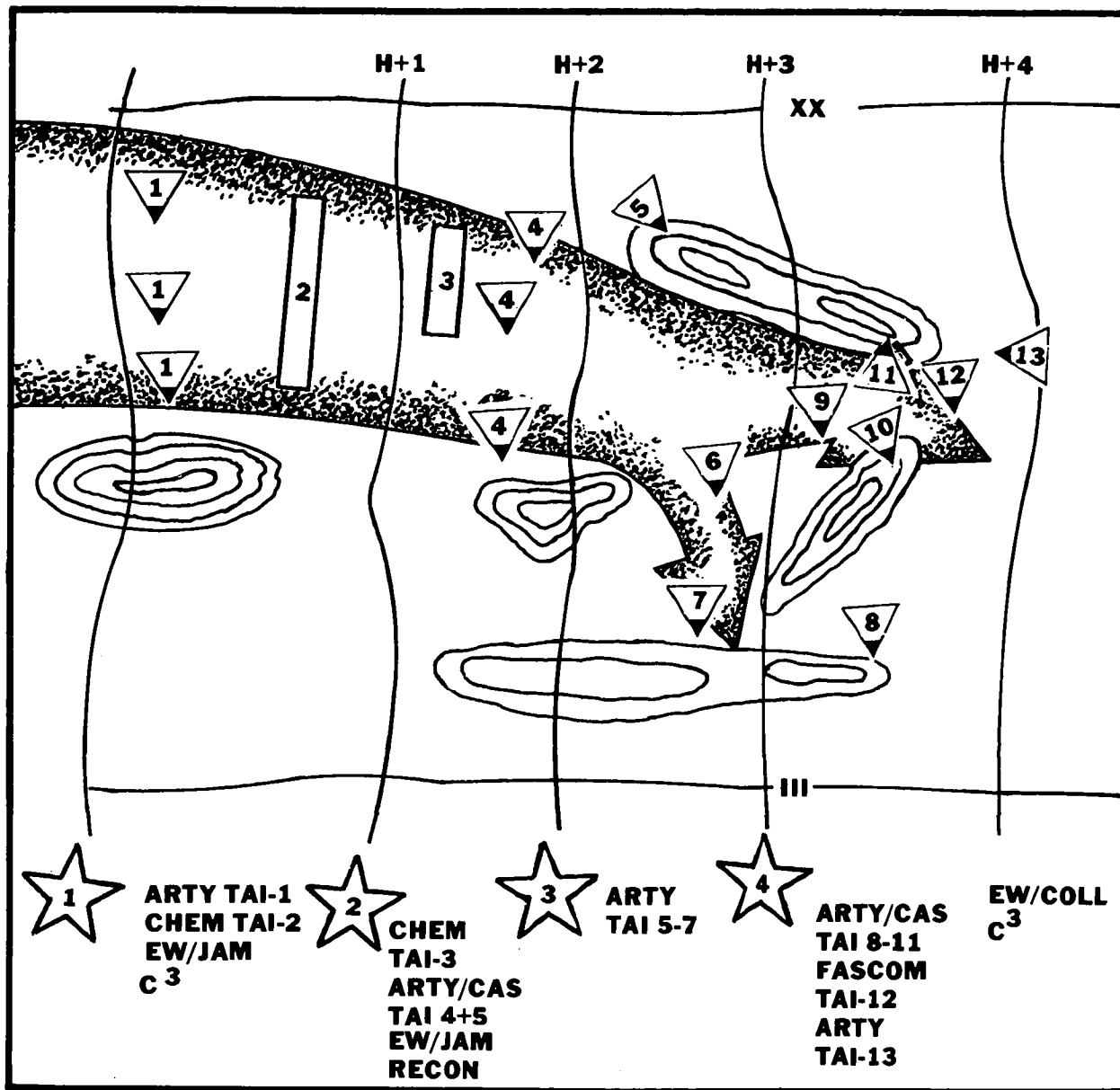


Figure A-12. Enemy withdrawal DST.

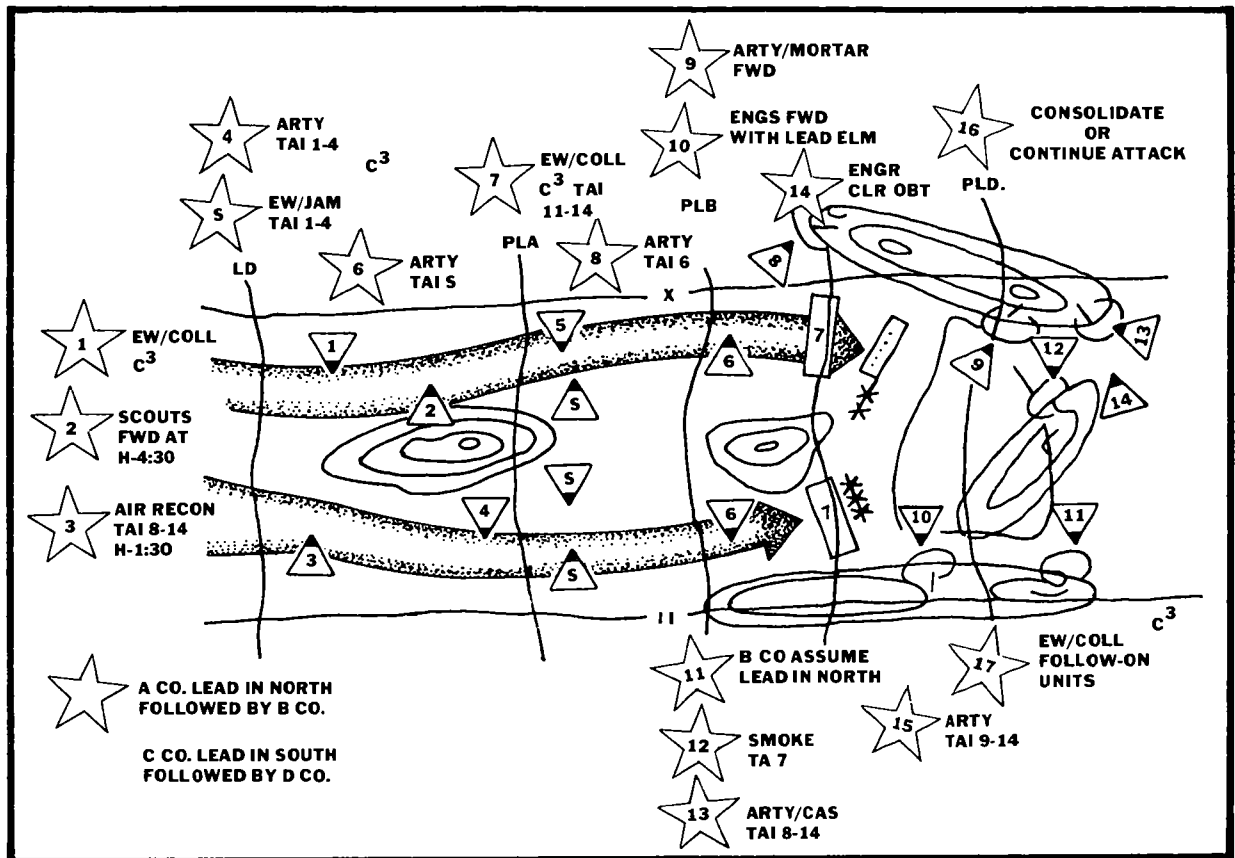


Figure A-13. Friendly attack DST.

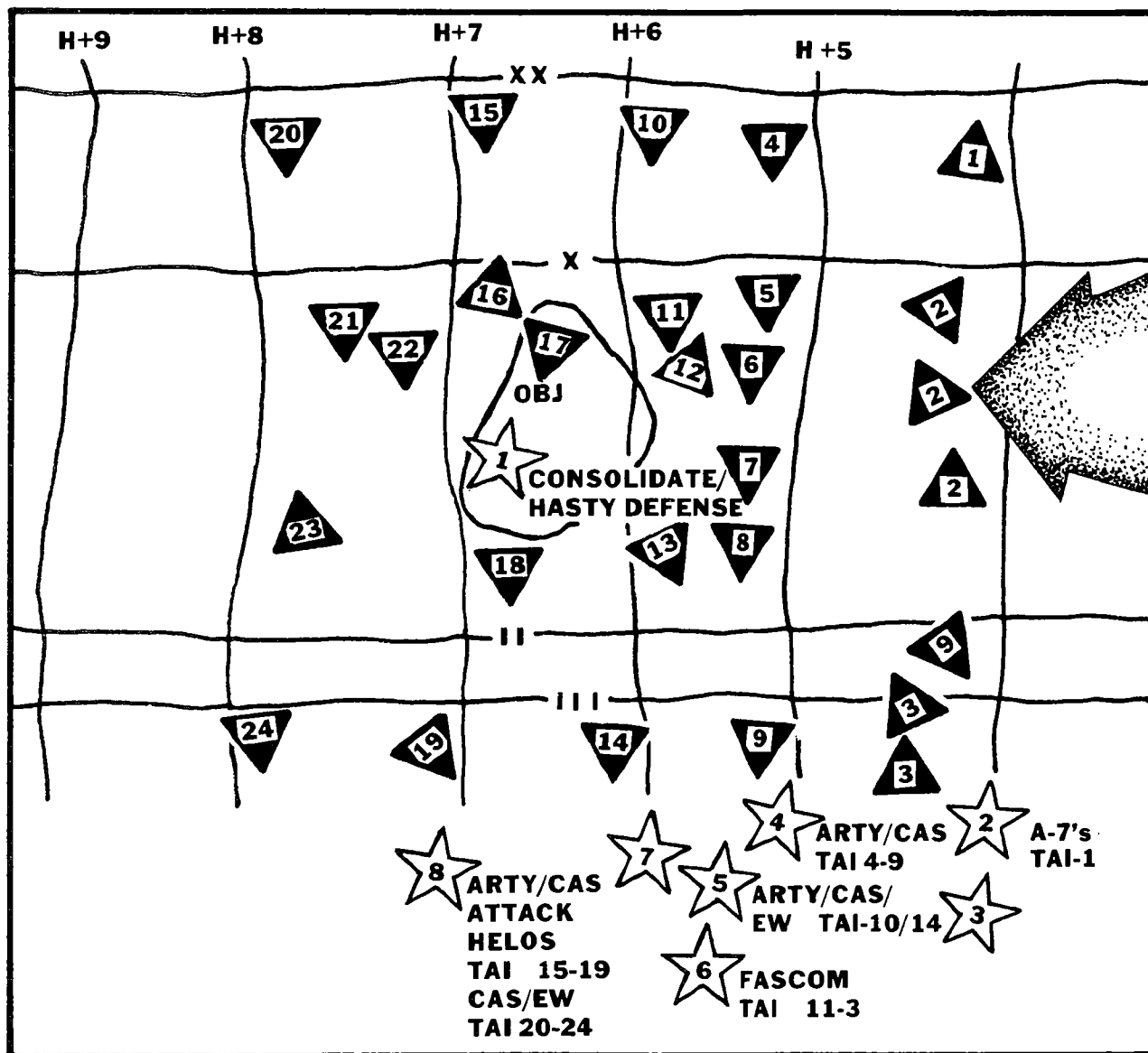


Figure A-14. Enemy DST (red DST).

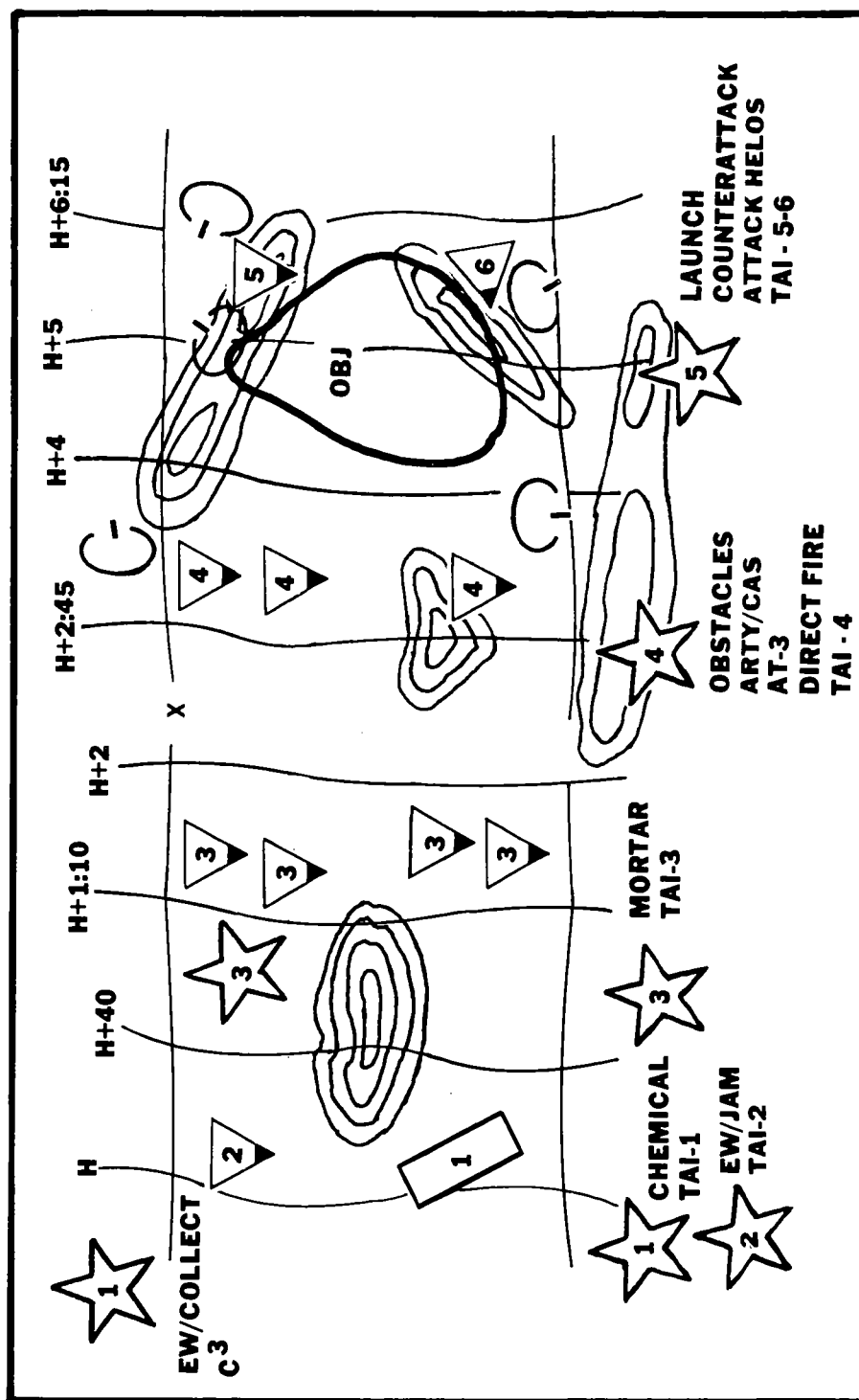


Figure A-15. Friendly DST (enemy counterattack).

opportunity, when friendly commanders can seize the initiative and launch their own offensive counterthrust. The G2 or S2 must be fully aware of the requirement to create these windows when analyzing the mission, and may recommend additional PIR or IR in support of their creation.

BATTLEFIELD AREA EVALUATION

Defensive battlefield area evaluation assesses the overall operational capabilities of the attacking enemy force in relation to the specific battlefield environment. The impact of the battlefield environment on friendly defensive capabilities and on potential friendly counterattack options is also considered.

The AO and the AI may be either static or dynamic during defensive operations. As the friendly force withdraws, the AO or AI expands with the withdrawal. The AO still begins at the friendly FLOT, but must reach farther into the friendly rear area as the force moves. The AI continues to extend into the enemy rear, and covers routes the enemy follow-on forces are expected to employ. The AI also extends into areas where flanking attacks could be expected and along routes which friendly counterattacking or reinforcing forces could employ.

TERRAIN ANALYSIS

The basic IPB terrain analysis process was developed to support defensive operations. However, there are some specific aspects which must be considered during AirLand Battle defensive operations.

LOS will be critical to the employment of direct fire, jamming, and target acquisition assets, remote chemical detectors, and to the attrition of the enemy force. Concealment of reserves, counterattacking elements, and reinforcements from enemy air and ground observation is a requirement to achieve the proper degree of timeliness, surprise, and mass. Obstacles must be considered regarding their effects on the friendly withdrawal, the enemy advance, friendly counterstrikes, and the enemy withdrawal. Failure to consider all of these factors could place the friendly force in an untenable position, cause counterstrikes to be launched when the enemy is on defensible terrain, or allow the enemy to fall back to a defensible position. Avenues of approach and mobility corridors are evaluated in terms of the friendly withdrawal, the enemy advance, and the friendly counterattack.

WEATHER ANALYSIS

As with terrain analysis, there are certain defense-specific considerations during weather analysis.

Reduced visibility favors the offense. It conceals force and enhances the potential for achieving surprise while reducing the cohesion and control of the defending force. However, reduced visibility is beneficial to retrograde operations and offers the same benefits to friendly counterattacking units as to attacking enemy forces.

Defensive elements in upwind positions enjoy better visibility than the attacking force. Dust plumes generated by vehicle movement are more pronounced in the downwind force. Forcing the enemy to move upwind slows the enemy's rate of advance and facilitates the use of smoke, chemical, and indirect fires. Windblown dust may prematurely divulge the positions of counterattacking units.

Low cloud cover will reduce the effectiveness of CAS, but will also limit the enemy's ability to conduct airborne or air assault operations. The reduced effectiveness of battlefield air interdiction will be critical in dealing with the enemy's follow-on forces.

THREAT EVALUATION

Threat evaluation for defensive operations includes a complete analysis of the enemy's attack doctrine. However, the development of a threat data base and doctrinal template file does not stop with attack doctrine. The analyst must also evaluate the enemy's doctrine for pursuit during a friendly withdrawal, for responding to a counterattack (hasty defense), and for conducting a withdrawal into a hasty or prepared defense.

Doctrinal templates are developed for each potential enemy operation. The doctrinal template file for defensive operations should contain templates on the following:

- Movement forward in anticipation of a meeting engagement.
- Prebattle formation.
- Battle formation.
- Envelopment (single and double).
- Exploitation or consolidation.
- Breakthrough.
- Pursuit.
- Withdrawal.

- Defense (hasty and prepared).
- River crossing (hasty and deliberate).

Doctrinal templates for enemy specialized and high value assets, such as air defense and communications units, are prepared as time and resources permit. Figures A-16 through A-18 show examples of doctrinal templates for various phases of an attack by an MRR.

If critical friendly assets such as airfields, chemical and nuclear weapons storage sites and depots, C² facilities, or nuclear-capable missile sites are located within the defensive sector, doctrinal templates for OMG and airborne or air assault operations should be prepared.

THREAT INTEGRATION

The development of situation, event, and decision support templates for defensive operations is basic to IPB.

The situation template relates the enemy's doctrine to the weather and terrain and is critical in determining where specific enemy assets and elements can and cannot maneuver on the battlefield. The template also assists the analyst in determining where and when terrain and weather constraints make the enemy force most vulnerable to a counterattack, or point to areas and situations where additional or special support is required to continue the attack. In short, the situation template helps determine the most defensible terrain for friendly forces and the least advantageous terrain for the enemy.

Situation templating also helps predict how the enemy will realign enemy forces in response to a counterattack, how enemy withdrawal will be constrained or aided, and when and where the enemy is likely to conduct a hasty or prepared defense should the attack fail.

Both the event templates and DSTs for a defensive operation must be developed using wargaming techniques. The analyst must attempt to determine where the enemy would most likely place NAIs to support enemy offensive intelligence collection efforts, and where the enemy would place TAIs and DPs to make the most effective use of enemy fire, maneuver, and EW assets. "Thinking red" becomes even more critical as friendly forces are forced to withdraw under enemy pressure. By determining where and when the enemy is most likely to employ enemy assets, friendly forces can be alerted to avoid the areas or situations where they are most vulnerable. This serves to make the enemy waste assets while conserving friendly combat capabilities for other, more critical situations.

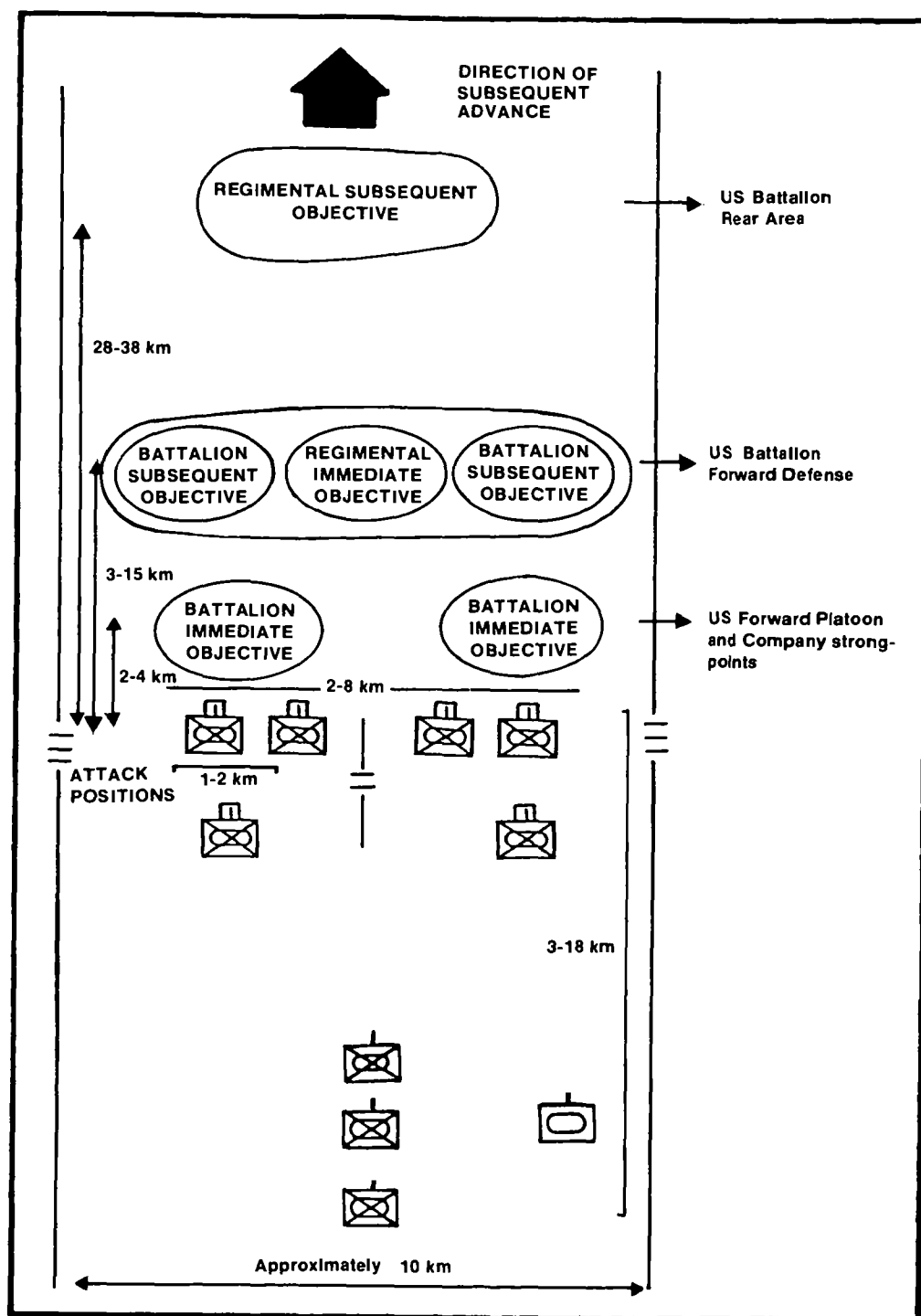


Figure A-16. MRR: Attack against a defending enemy.

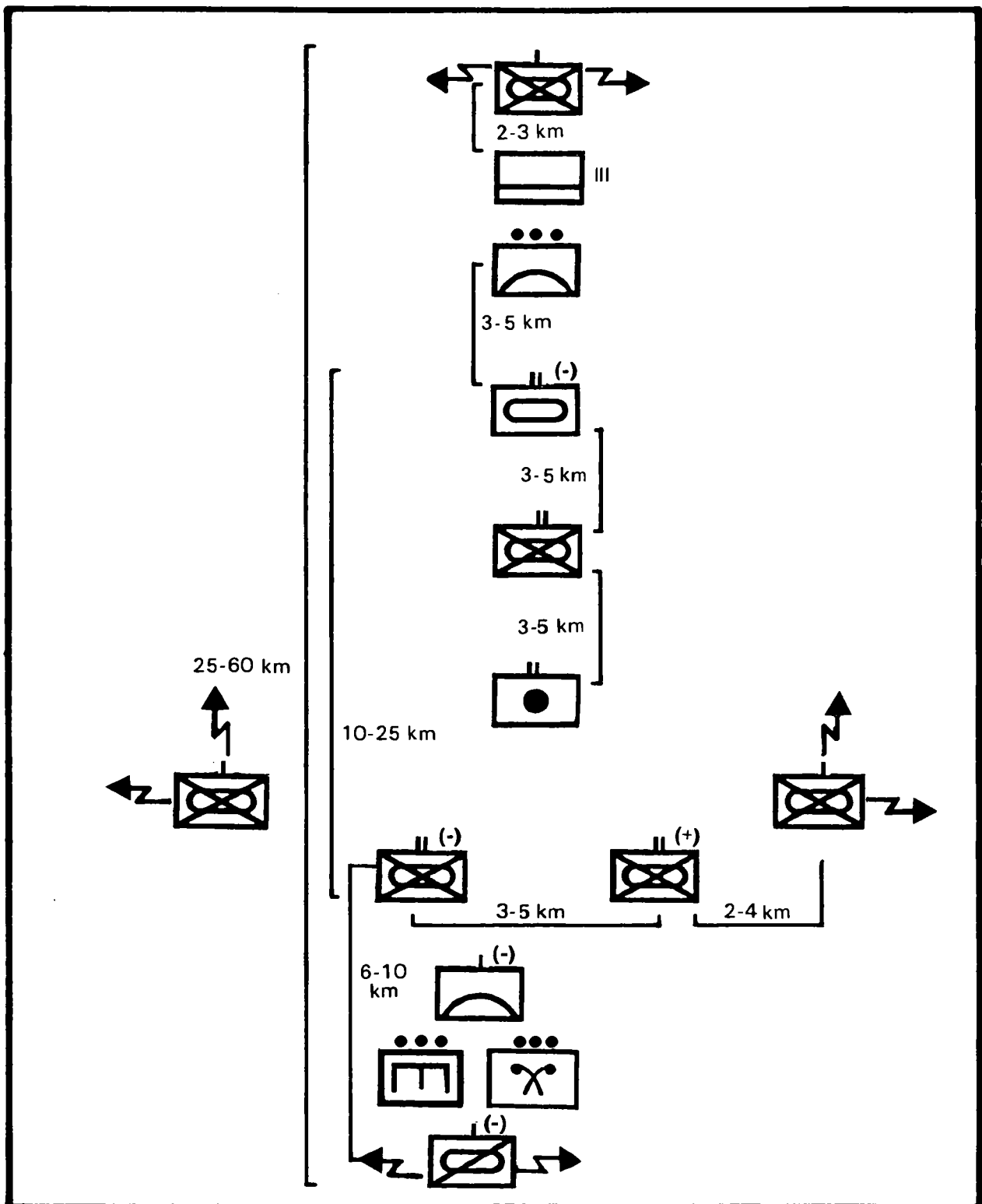


Figure A-17. MRR: Prebattle formation (reverse wedge).

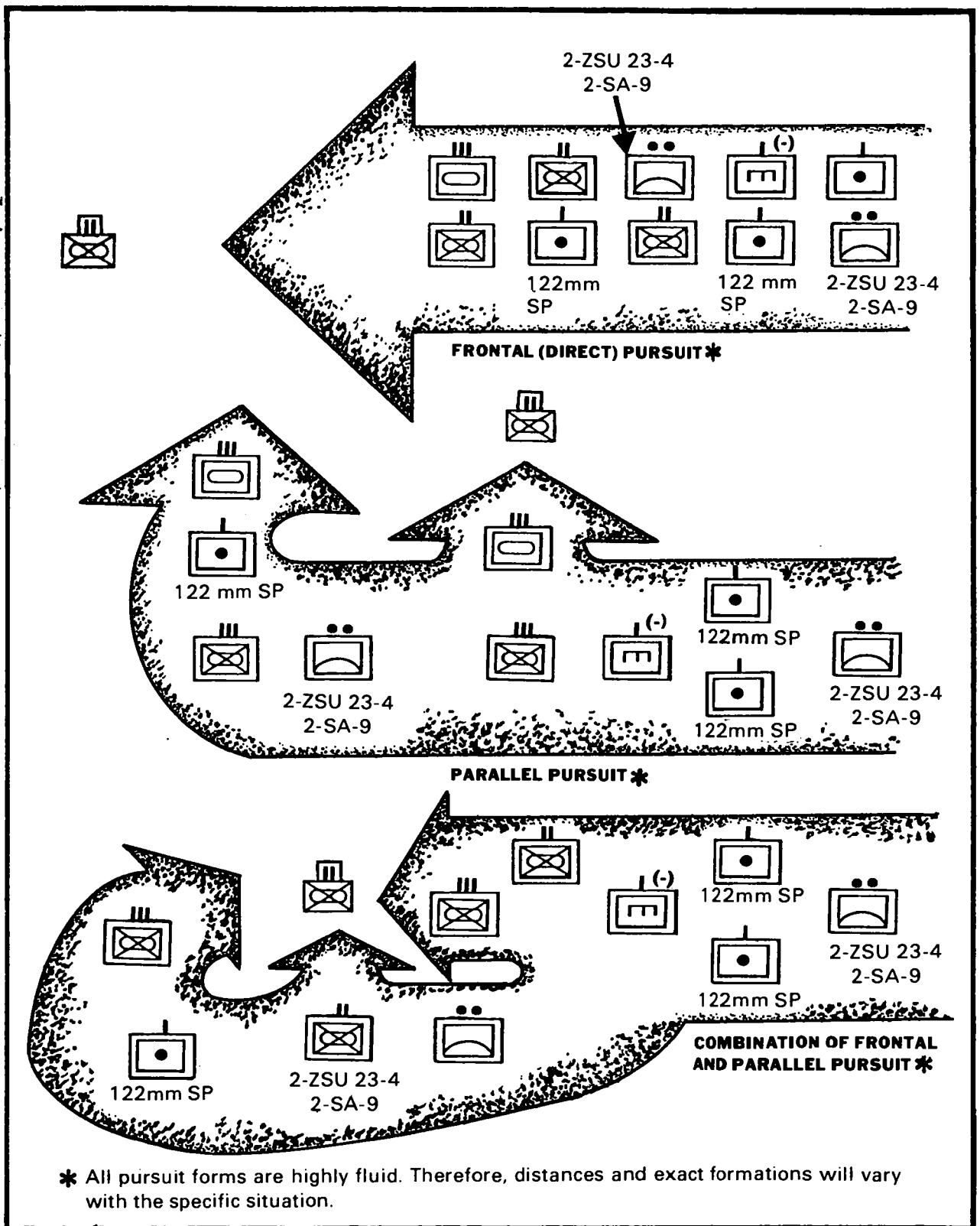


Figure A-18. MRR: Deployment during pursuit.

Also critical is the development of a DST to support the friendly counterattack. Again the template is developed through wargaming. The TAls and DPs must be based on a thorough analysis of how the enemy will react to the counterattack, and how the enemy will attempt to negate its effects. If the counterattack forces the enemy to withdraw, the DST must provide DPs and TAls for interdicting the enemy's withdrawal. As the enemy withdraws, the DST must depict where the enemy is most likely to establish a hasty defense, and where the enemy is most likely to launch a counterstrike. DPs and TAls that assist the commander in disrupting the enemy's efforts to establish a defense or to generate a counterattack must be determined.

Finally, the necessity of creating windows of opportunity focuses the defensive decision support templating effort on potential enemy reinforcement by follow-on forces. The routes that these forces must take to reach the close-in operations areas must be targeted for deep interdiction assets and DPs positioned to allow for successful interdiction.

Under AirLand Battle there may actually be very little difference in offensive and defensive IPB. Both will have to plan for the offense and the defense to be effective. Both will have to consider the enemy's follow-on assets. Finally, both will have to plan for a multiphased battle and make the maximum use of all available assets to ensure success.

APPENDIX B

INTELLIGENCE PREPARATION OF THE BATTLEFIELD IN THE URBAN BATTLE

Friendly and enemy doctrines recommend avoiding combat in built-up areas. War in Europe, Korea, or any other heavily populated area inevitably requires combat in cities. In many cases, large urban areas cover major lines of communication, or sit astride main supply routes. These urban areas will have to be attacked or taken to further the advance or to effect the continual flow of supplies. Political rather than military considerations may dictate that a city be attacked or defended, and may even dictate the methods employed in the effort.

Additionally, the increasing focus on LIC, urban terrorism, and civil disorder adds to the realization that more attention must be given to urban combat. This is especially true in the case of urban insurgency, which has become a well-organized strategy. Urban insurgencies currently being carried out in various parts of the world are causing serious problems for the authorities; they have forced the militaries to develop new strategies to cope with this growing problem. The refinement of IPB doctrine to include low-, mid-, and high-intensity urban combat operations is a direct result of our realization of the actual situations that will be encountered.

The requirements for combat in built-up areas create a variety of troop control, maneuver, and equipment utilization problems. Urban combat also imposes a number of demands that are different from ordinary field conditions. These specific demands include requirements for--

- Larger forces.
- A slower pace and tempo of operations, and an increase in methodical, synchronized operations.
- A longer duration of commitment.
- Longer preparatory and counter-preparatory fires.
- Almost constant communications between individual forces.

Urban defensive operations and insurgent and terrorist actions depend on the holding or attack of critical areas. During actual combat these critical sites provide stability for the defense and are the basis for freedom of maneuver. Insurgents and terrorists rely on such areas to provide a basis for further operations and to spread counterterrorist or counterinsurgent forces over a wider area. No matter which situation applies, combat in urban terrain is expected to break down into a number of small-unit battles fought by battalions, companies, platoons, and squads or small assault groups in confined areas. These conditions create--

- The requirement to fight small-scale battles which inhibits centralized control and forces independent action by small unit commanders. This especially impacts on the Soviet preference for close centralized control and large-scale operations.
- The problem of training small units for combat in urban areas and other inherent and probably unanticipated difficulties in maintaining morale.
- Confined spaces which limit observation, Foff, and maneuver.
- The inability to maneuver which prevents the concentration of fire maneuver elements at critical points.
- A greater demand for ammunition and rations, thus imposing unusual strains on logistics elements.
- Problems with conducting effective reconnaissance during conventional operations. Reconnaissance by force becomes the most effective reconnaissance means. This method involves probing a defense with successively larger units until the enemy positions are disclosed and can be successfully attacked. During unconventional operations, the opposite is true. R&S are easily accomplished by both sides, and may be unstoppable.
- Limitations in the ability to employ maximum combat power. Effective employment of combat power may be limited by the requirement to minimize damage. The terrain in the urban area can be expected to change during the battle, thereby complicating terrain analysis efforts. Urban terrain provides many small unit infiltration and movement routes which would not be considered during open area combat.
- Situations in which small unit defensive positions can slow or stop the advance of a considerably larger force, and will require disproportionate efforts to be reduced.

All of these problems are expected to have a significant impact on the IPB process. Battlefield area analysis will assume an entirely different focus. The normal terrain evaluation process will require significant modification. Most weather factors will have less impact on operations. However, light data will assume a much greater importance. Familiar threat doctrine will not apply to urban terrain, and weapons system capabilities will be seriously degraded. The extreme potential for diversity in applying doctrine to urban terrain increases the difficulty of developing situation and event templates. The slower pace, smaller size, and increased numbers of operations will reduce or negate the effectiveness of time phasing. In addition, the matrix of streets makes the identification of TAs and DPs extremely difficult. The composition of the built-up area will determine how the IPB effort must be focused. A city with a major commercial area and multistory buildings will require a significantly different focus than a town of single-story residences or a major industrial and rail center.

BATTLEFIELD AREA EVALUATION

Battlefield area evaluation for the urban battle involves the analysis of the urban area and a definition of the actual area to be considered. Questions to consider are--

- ° Is the mission offensive or defensive?
- ° Is the AO a typical European town with narrow streets, circular configuration, and low-terrain location?
- ° Is the AO a Korean city with cities within a city, terrain-covering sprawl, and outlying industrial areas; or a major commercial, railroad, and navigation center with urban sprawl, and numerous light and heavy industries?
- ° Is the threat a conventional force, an urban insurgency, a terrorist group, or a guerilla war that has spread to the urban area?
- ° What are the political considerations of the operation?

Built-up areas are normally classified by size. The Soviets also classify cities by size and include the estimated perimeter of the city. US doctrine for classification also includes the built-up areas which form the connecting links between villages and towns. These strip areas are found along LOCs. Figure B-1 shows both the US and Soviet urban area classification criteria.

In addition to being classified by size, areas within cities and towns are classified by individual building and street layout patterns. These patterns have been categorized into five basic layouts which recur consistently throughout Europe, and which have parallels in Korea, Japan, and the Middle East. The five patterns are--

- ° Dense, random construction.
- ° Closed-orderly block.
- ° Dispersed residential area.
- ° High-rise area.
- ° Industrial or transportation.

Dense, random construction, as shown in Figure B-2, is the typical old inner-city pattern. Narrow winding streets radiate from a central area in an irregular manner. Buildings are closely located and frequently are close to the edge of the roadway. This pattern is found in cities, towns, and villages throughout Europe and Korea.

US		
SIZE	POPULATION	
Large City	over 100,000	
Towns and Small Cities	3,000 to 100,000	
Villages	less than 3,000	
SOVIET		
SIZE	POPULATION	ESTIMATED PERIMETER
Large	100,000 or more	25KM +
Average	50,000 to 100,000	15 to 25KM
Small	Less than 50,000	less than 15KM

Figure B-1. US and Soviet urban area classification criteria.

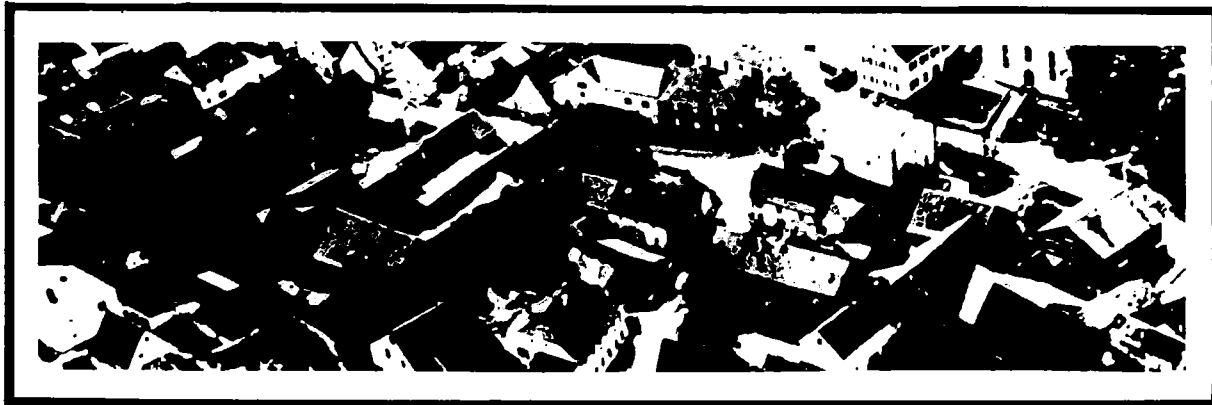


Figure B-2. Example of a dense, random construction area.

The closed-orderly block pattern, as shown in Figure B-3, is common to the central areas of towns and cities. Wider streets generally form rectangular patterns. Buildings frequently form a continuous front along the blocks. Inner-block courtyards are common. Largely restricted to commercial areas in Europe, this pattern will likely be interspersed with light industrial or high-rise areas in Korea and Japan.

The dispersed residential area, as shown in Figure B-4, is normally contiguous to closed-orderly block areas in Europe. The pattern consists of row houses or single-family dwellings with yards, gardens, trees, and

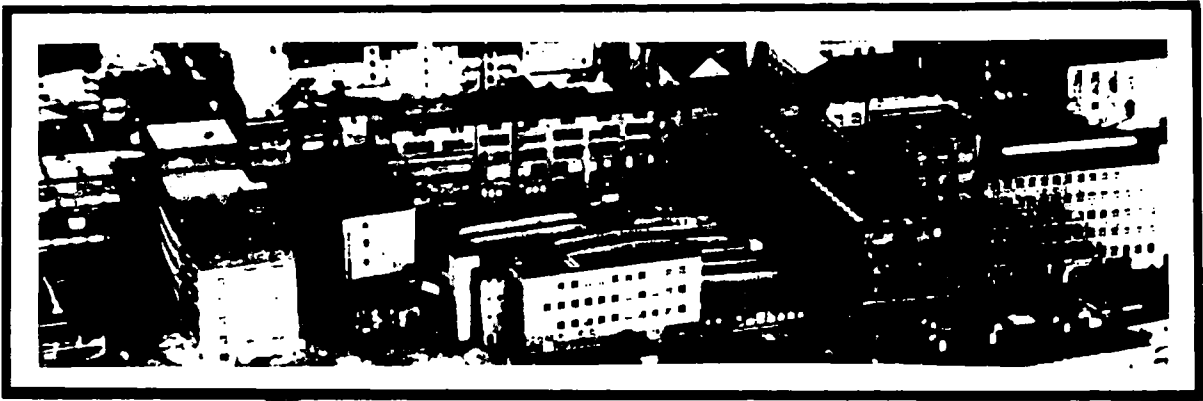


Figure B-3. Example of a closed-orderly block area.



Figure B-4. Example of a dispersed residential area.

fences. Street patterns are normally rectangular or curving. Such areas are limited to upper-class areas in oriental cities and towns.

The high-rise area, as shown in Figure B-5, is typical of modern construction in larger cities and towns. It consists of multistoried apartments, separated open areas, and single-story buildings. Wide streets are laid out in rectangular patterns. These areas are often contiguous to industrial or transportation areas or interspersed with closed-orderly block areas.



Figure B-5. Example of a high-rise area.

Industrial or transportation areas, as shown in Figure B-6, are generally located on or along major rail and highway routes in urban complexes. Older complexes may be located within dense, random construction or closed-orderly block areas. New construction normally consists of low, flat-roofed factory and warehouse buildings. High-rise areas providing housing for workers are normally located adjacent to these areas throughout the orient. Identification of transportation facilities within these areas is critical. These facilities, especially rail facilities, pose significant obstacles to military movement.

The AO in urban warfare, like the normal AO, is assigned by higher headquarters. Like the normal AO, it is defined by depth, frontage, and height (airspace). Unlike the normal area, it also includes underground operations. Sewers, basements, subways, and underground cisterns and reservoirs force an entirely different analytical focus. Tall buildings add a new dimension to airspace analysis, both from a perspective of the Foff they permit and their effects on aircraft and air defense operations.

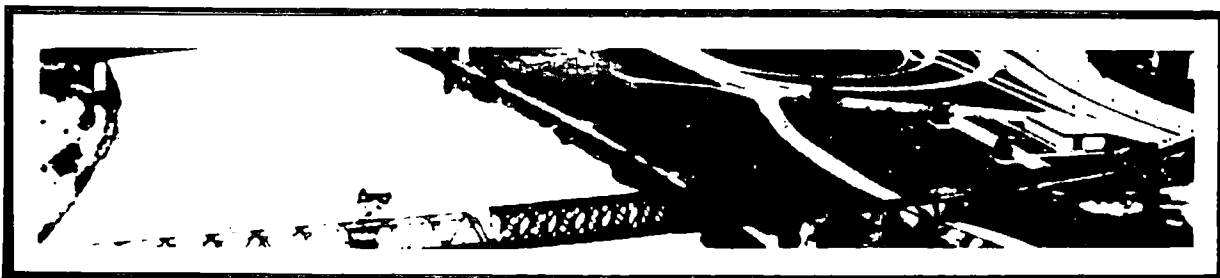


Figure B-6. Example of an industrial or transportation area.

The AI will still be based on the commander's concept of the operation and METT-T factors. However, the commander will have to alter the AI to include access and withdrawal routes into and out of the built-up area. Particular attention should be directed to routes where withdrawal can be blocked by obstacles or by airlanded forces. The AI should also include all potential underground routes into the commander's AO. This information will preclude an enemy force from unexpectedly appearing in an area that has already been cleared.

The battlefield evaluation must include a detailed examination of the enemy force that is expected to be encountered. Operations against an enemy MRB will differ significantly from operations against a light infantry, insurgent, or terrorist force. Each will require a different mix of forces and tactics. Urban guerillas and terrorists represent entirely different situations which require special techniques. The nature of the enemy, together with the political considerations involved, will determine how commanders will employ their forces in the urban environment.

Another primary consideration is that every city is different. Therefore, battlefield evaluation must be concerned with the specific characteristics of each urban area rather than the general nature of the AO. The evaluation must also consider that urban operations will reduce both friendly and enemy operational capabilities by inhibiting fire, maneuver, and jamming potential.

Finally, the evaluation must consider that in no other form of combat are the pressures of battle more intense. Continuous close combat, high casualties, and the fleeting nature of targets and fires from a frequently unseen enemy produce severe psychological strain and physical fatigue, particularly among soldiers and small unit leaders.

TERRAIN ANALYSIS

Terrain analysis for the urban battle differs significantly from that of open country. Although the five military aspects of terrain are still considered, the familiar rules of terrain analysis cannot be applied to the urban environment. The normal graphic terrain products, such as MCOO, also have little application to the urban area. Special terrain products must be developed for urban combat. These include specialized overlays, maps, and plans augmented by vertical or hand-held imagery. This is not to say that the MCOO, with its depiction of NO-GO, SLOW-GO, key terrain, obstacles, and avenues of approach or mobility corridors, has no application to urban combat. Rather, it means that an MCOO must be developed for the urban battle, and the focus of the analysis of the terrain must be altered to consider the special implications of urban terrain.

SPECIAL CONSIDERATIONS

Military maps, normally the basic tactical terrain analysis tool, do not provide sufficient detail for urban terrain analysis. Military maps also have too small a scale and are normally too outdated to be useful for purposes more detailed than general urban pattern analysis. Standard city maps are the basic tool of urban terrain analysis. However, urban terrain is dynamic. Towns and cities are constantly growing, adding new structures and demolishing existing structures. Therefore, any map of an urban area, including city maps or plans published by the city, state, or national government, will be inaccurate and obsolete to some degree. As such, photomosaics should be constructed for use in conjunction with or in lieu of city maps to support urban terrain analysis.

The nature of combat can radically alter the terrain in an urban area in a very short time. Incidental or intentional demolition of structures can change the topography of the area radically, quickly destroying reference points, creating obstacles to mobility, and providing the defenders with additional defensive positions. As urban areas grow, street patterns often change, presenting an attacking force with additional withdrawal routes to block with obstacles or maneuver elements and a defending force with additional withdrawal and reinforcement routes.

Maps and diagrams of sewer systems, subway systems, underground water systems, elevated railways, mass transit routes and utility generation, and holding and transmission facilities are important during urban operations. Sewer and subway systems provide covered infiltration and small unit-approach routes. Elevated railways and mass transit routes provide mobility between city sectors, and point to locations where obstacles might be expected. Utility facilities are key targets for insurgents, urban guerillas, and terrorists, and their destruction can hinder the capabilities of a defending force.

Certain public buildings must be identified during the terrain analysis phase of urban IPB. Hospitals are critical because the laws of war prohibit their attack when not being used for military purposes other than medical support. As C² breaks down during urban operations, hospitals become an important source of medical support to combat forces. Platoons, squads, and individual fire teams will frequently be deprived of medical support, and the availability of civilian hospitals may determine whether or not injured personnel survive. The same is true during insurgency, urban guerilla, or terrorist actions. Knowledge of the location of civilian hospitals, clinics, and surgical facilities is critical in dealing with civilian and military casualties.

Stadiums, parks, sports fields, and school playgrounds are of high interest during both conventional and unconventional urban operations. These provide excellent civilian holding areas, interrogation centers,

insurgent segregation areas, and prisoner of war (PW) holding facilities. These open areas also provide excellent helicopter landing sites which can be employed for air assault, medical evacuation, air insertion, and air-assisted C². As these areas are often centrally located within a city or city district, they provide excellent logistic support areas and offer excellent air resupply possibilities.

Construction sites and commercial operations such as lumber yards, brick yards, steel yards, and railroad maintenance yards are of high interest, especially during unconventional operations. These serve as primary sources of obstacle construction materials when rubble is insufficient or not present. They can also provide engineers with materials to strengthen existing rubble obstacles or with materials for antitank hedgehogs or crib-type roadblocks.

Public baths, swimming facilities, cisterns, and reservoirs are of special interest. They are especially useful in providing bathing facilities for combat personnel, thus helping to maintain morale in a situation which contributes to rapid morale deterioration. The conditions prevalent in urban combat often cause personnel to become dirtier more quickly than during combat in open areas. These facilities also provide an alternate water source when public utilities break down. Public latrines can also assist in morale maintenance, but are often connected to the utility systems which are the first to break down in conventional operations.

URBAN PATTERNS

The layout of an urban area will normally follow a definite pattern which is easily identified. Terrain analysts recognize three basic patterns and two basic subpatterns. The identification of the specific pattern or subpattern is an integral part of the urban terrain analysis process.

Hub Phenomenon

The hub or built-up area is central to any urban pattern. Although it may vary in size, the effects remain constant. The hub may serve as the pivot or anchor point for a defense, or as an element of a defense in-depth. The hub is an obstacle which blocks the attacker's advance. When terrain permits, the hub will normally be bypassed. As the attacking force slides off the leading edge of the hub, it becomes vulnerable to flank attacks and ambushes along the new axis of advance.

Where adjacent terrain is unsuitable for bypass operations, the hub may be developed as a defensive strongpoint. Attack then requires a significant increase in forces and results in intensive combat in the built-up area. Figure B-7 shows an example of a hub phenomenon.

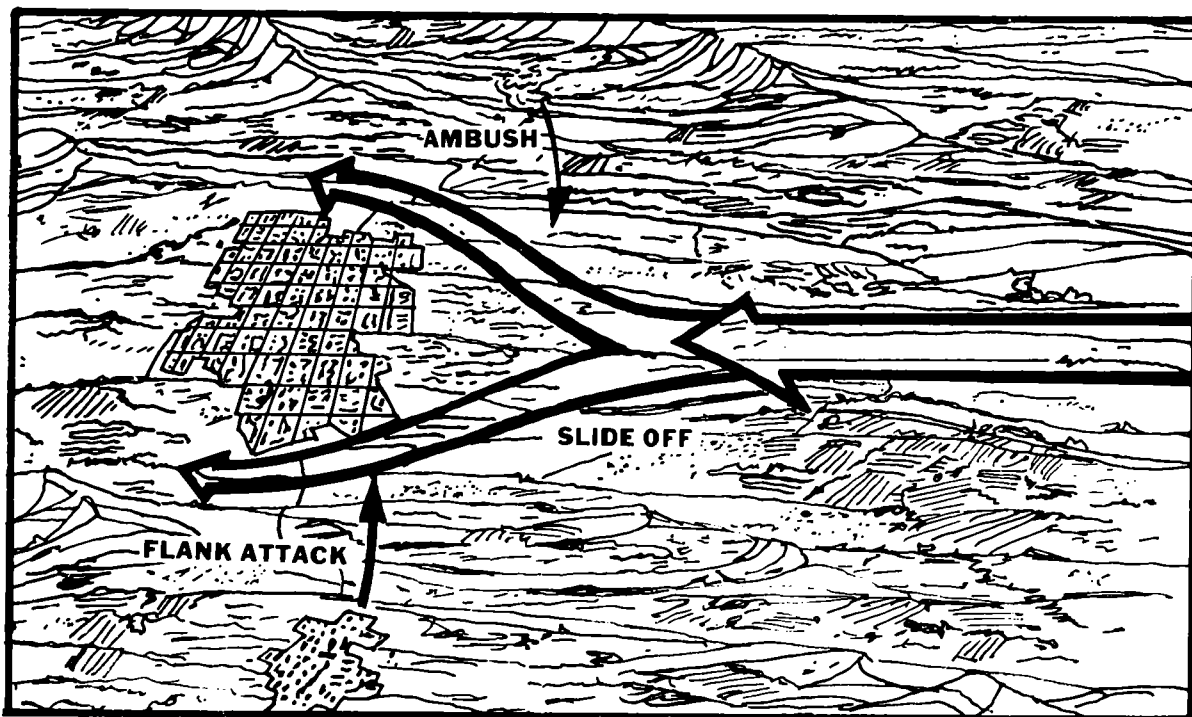


Figure B-7. Example of a hub phenomenon.

Satellite Pattern

This pattern consists of a central hub and dependent, dispersed, smaller built-up areas with linear arrays along the connecting links. Links tend to focus on the central hub, with most taking the form of farm, forest, or secondary roads. Normally only a single main route will pass through the central hub. Figure B-8 shows an example of a satellite pattern. The pattern provides a mutual support situation for urban combat by providing--

- Resupply and evacuation routes for the defenders.
- Reinforcement routes for the defenders; avenues of approach or mobility corridors for the attackers.
- Mutually supporting defensive battle positions.
- Multiple exit links from the hub for the attacking force.

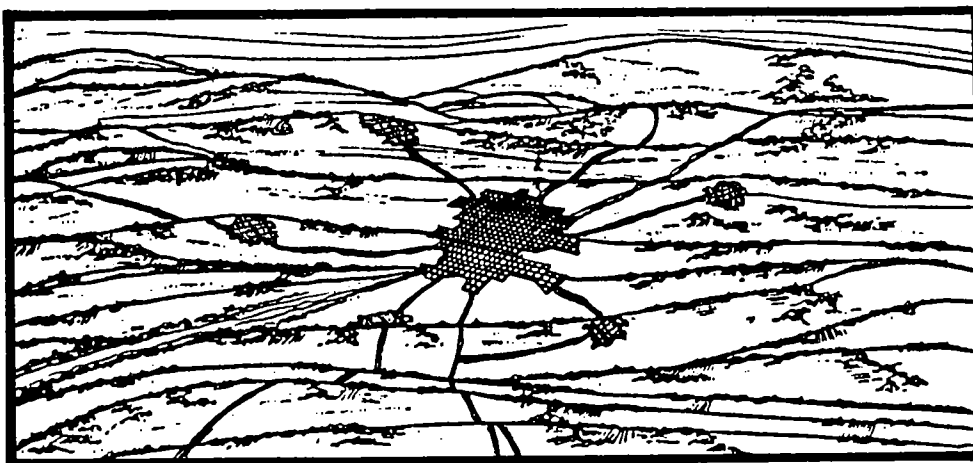


Figure B-8. Example of a satellite pattern.

Network Pattern

This pattern is similar in appearance to the satellite pattern but is more complex and diverse. The pattern represents the interlocking of the primary hubs of satellite patterns. Formed primarily of towns and cities, its elements are more self-sufficient and less supportive of each other, although a dominant hub may exist. Major LOCs within a network are more extensive than in a satellite and may take on a rectangular rather than convergent form. The natural terrain within a network may be more varied than that contained in a single satellite array.

The network pattern causes attacking units to have to fight through a maze of synthetic features that provide defensive obstacles. Bypass is difficult because contiguous terrain is often unsuitable for mounted operations. The pattern provides depth to the defense. Figure B-9 shows an example of a network pattern.

Linear Pattern. This pattern is a subelement of the three basic patterns. The linear array may form one or more rays of the satellite pattern or the connecting links of a network. Most frequently the basic array results from the stringing of minor hubs along a confined natural terrain corridor. This pattern facilitates the development of a series of strong defensive positions in-depth. It also acts to delay canalized forces and requires repeated deliberate attacks.

Segment or Pie Slice Pattern. This pattern may occur as a subset of either the satellite or network patterns, or within a major hub. It is characterized by the splitting of an urban area by a dominant natural terrain feature such as a river or by synthetic features such as roads, railroads, and canals. The pattern may influence the assignment of boundaries and other control measures, or of attack objectives. The pattern may also bear directly on the organization of the terrain and on

task organization. Figure B-10 shows an example of a segment or pie slice pattern.

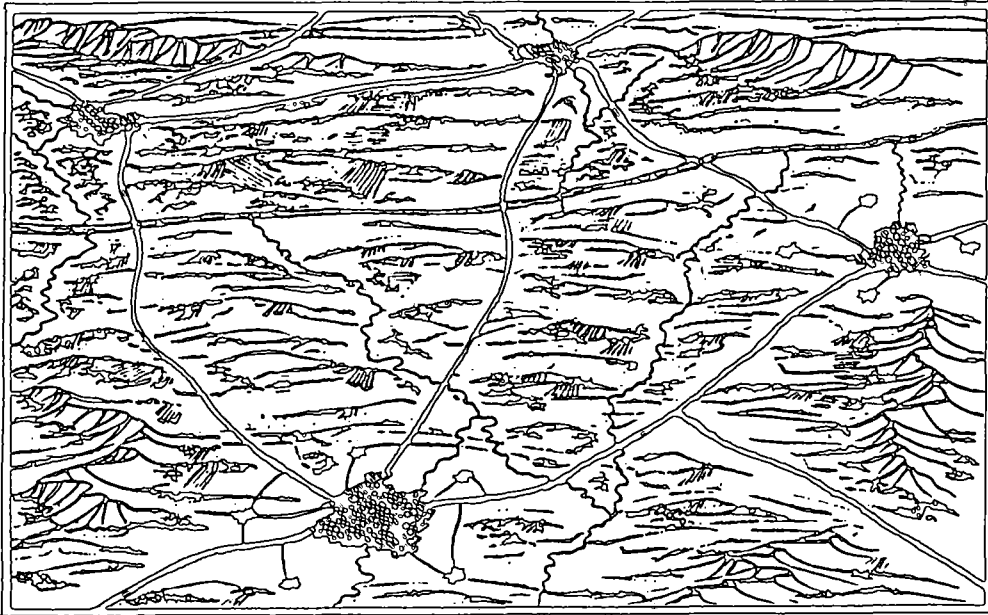


Figure B-9. Example of a network pattern.

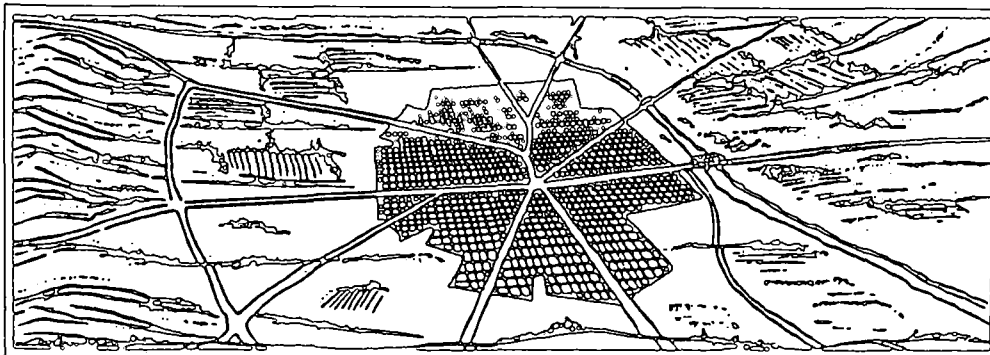


Figure B-10. Example of a segment or pie-slice pattern.

PATTERN EFFECTS

In addition to the basic blocking action caused by the hub phenomenon, other effects can be associated with urban patterns.

The Funnel-Fan Effect

This effect normally occurs when the hub is located between terrain features that are unsuitable for mounted operations. Movement of units into the area results in the concentration of forces, a loss of offensive momentum, and canalization. Beyond the hub, forces are required to spread or fan out before full combat power can be developed. This favors the defense because it creates an accordion effect in units moving through the hub, reducing C² and operating effectiveness. A similar effect occurs when an attacking force must penetrate an urban network on a narrow front between hubs. Figure B-11 shows an example of a funnel-fan effect.

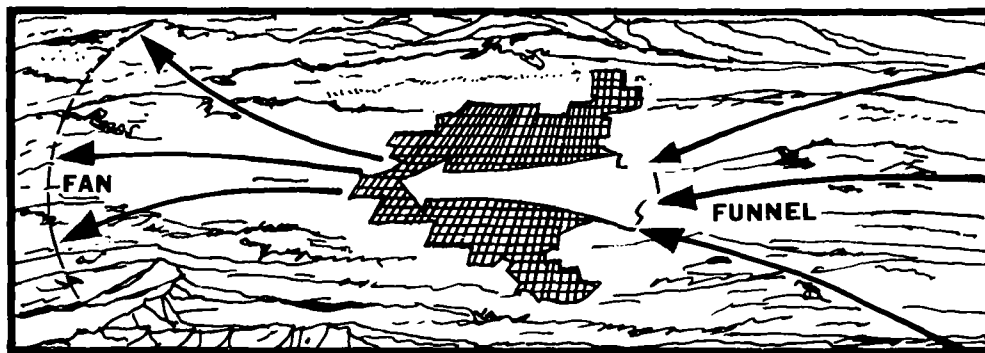


Figure B-11. Example of a funnel-fan effect.

The Funnel Effect

Funneling or concentration and canalization of forces may occur without immediate fanning. This occurs most frequently when the linear pattern is encountered. It limits the number of maneuver units that may be applied against a series of hubs that must be confronted in succession, and forces a greater reliance on long-range and indirect fire weapons.

THE MILITARY ASPECTS OF TERRAIN

Urban terrain is analyzed by the five military aspects of terrain, the individual building and street layout pattern, and the echelon of the friendly unit. For example, a brigade may be concerned with an entire city, town, or city district, while battalions or task forces may be concerned with city blocks or even with individual buildings. The restrictive nature of urban terrain forces the analyst to be concerned with minimum rather than maximum weapons ranges, as some weapons that are highly effective in open country are unusable in urban areas. The five military aspects of terrain are discussed below according to the five street layout patterns.

Observation and FofF

Dense, Random Construction. Weapons ranges and observation distances seldom extend more than 100 meters. Narrow streets limit tank turret traverse and do not allow for minimum ATGM ranges. Buildings and narrow streets restrict the deployment of heavy direct-fire weapons. Short observation and FofF distances necessitate assigning small sectors to defending units.

Closed-Orderly Block. Observation and FofF extend up to 350 meters and are sufficient for heavy direct-fire weapons and ATGMs in most areas. Streets and open areas permit the establishment of normal supporting fires. Indirect fire observation will be limited by numerous tall buildings and smoke. Flanking fires can normally be established along straight sections and in other open spaces. Attacking forces will require small, narrow attack zones and high-troop density.

Dispersed Residential Areas. Weapons ranges are often reduced to less than 250 meters by winding streets. Straight street sections often extend the weapons range. Buildings, hedges, bushes, walls, and other obstructions limit the effectiveness of small arms, ATGMs, and heavy direct-fire weapons. The defender can establish mutually supporting fires while the attacker cannot.

High-Rise Areas. Mutually supporting fires can be established between buildings during both offensive and defensive operations. Maximum weapons ranges can be achieved by positioning weapons in the upper stories of buildings.

Industrial or Transportation Areas. Quite often, these areas are situated on the outskirts of cities. Open areas provide excellent observation and FofF over the entire area, and facilitate the employment of CAS and indirect fires. Smoke from burning fuel storage may hinder accurate fire direction.

Concealment and Cover

Dense, Random Construction. Buildings provide numerous concealed infantry positions and isolated armored vehicle positions. Thick masonry--stone and brick walls--offers excellent protection from direct fire. Adequate overhead protection is found only in basements, as most roofs, ceilings, and floors are constructed of wood or plaster. Underground systems offer excellent protection and often permit movement between battle positions.

Closed-Orderly Block. Heavy construction provides excellent protection against direct and indirect fires. However, buildings selected for shelter must be evaluated for their ability to withstand collapse. Underground systems are normally extensive and provide storage areas, protection, and mobility. Those underground systems not used must be blocked by either obstacles or maneuver elements. Advancing along open streets courts disaster and should be avoided whenever possible.

Dispersed Residential Areas. Limited concealment and cover are provided by walls, fences, hedges, and houses. Overhead protection varies, but basement positions usually provide sufficient overhead cover. Construction often permits the concealment of, and provides limited cover for armored vehicles.

High-Rise Areas. High-rise structures provide protection from indirect fires, but only limited protection from direct fires. Concealment and cover are often not available unless adjacent buildings are secured. Attacking forces must employ heavy covering fire, smoke, and rapid movement to move from one building to another.

Industrial or Transportation Areas. Little concealment and cover are available in these areas due to the construction and the dispersed nature of the buildings. Some concealment is offered by buildings, but shed-type buildings should be avoided.

Obstacles

Dense, Random Construction. Narrow streets with buildings constructed directly on the street facilitate construction or creation of obstacles. Demolition of structures creates instant rubble obstacles.

Closed-Orderly Block. The wider streets and heavy construction make rubble less of an obstacle. Obstacles are difficult to construct, but once constructed are difficult to reduce or bypass because of the relative ease by which they can be controlled by fire.

Dispersed Residential Areas. Rubble is not a significant obstacle. Most obstacles in streets can be bypassed easily, but will reduce mobility to some degree.

High-Rise Areas. Mines between buildings are the most effective obstacles. Rubble will not be a factor unless major structures are totally destroyed.

Industrial or Transportation Areas. Railyards, elevated rail and roadways, ramps, loading docks, numerous high-tension lines, canals, overpasses, pipelines, and overhead obstructions such as cranes create significant obstacles to movement. Armored vehicles should avoid railyards whenever possible, as tracks will quickly damage vehicles and the open yards themselves provide excellent defensive Foff. Rubble that may be present is normally easily bypassed.

Key Terrain

Examples of urban key terrain include--

- ° Subway systems.
- ° Sewer systems.

- Underground water systems.
- Utility (gas and electric) generation, holding, and transmission facilities.
- Telephone exchanges.
- Radio and television stations.
- Rail and transit service connecting points.
- Stadiums, parks, sports fields, and school yards.
- Tall buildings (rooftops).

Avenues of Approach

Avenues of approach are analyzed for battalion and smaller unit operations as the battalion is the most effective force of any size that can be employed under urban conditions. Avenues of approach are dictated by the urban pattern and the actual mission. Urban avenues of approach will cover unusually narrow frontages and, when possible, multiple avenues will be employed to permit flanking and rear area attacks in support of the main effort. Figure B-12 shows typical avenue of approach widths for the five basic types of urban terrain.

<u>AVENUES OF APPROACH</u>	<u>WIDTHS IN METERS</u>
Dense, Random Construction	150-200
Closed-Orderly Block	200-300
Dispersed Residential Areas	300-400
High-Rise Areas	300-500
Industrial or Transportation Areas	400-600

Figure B-12. Avenue of approach widths.

URBAN MC00 DEVELOPMENT

If maps of the urban area are available, an MC00 is prepared. The MC00 shows construction patterns and depicts known obstacles and avenues of approach or mobility corridors. A MC00 can also be prepared using photographic maps of the city. If maps are not available, imagery of the built-up area should be annotated with the information. Figures B-13 and B-14 show examples of urban MC00 development.

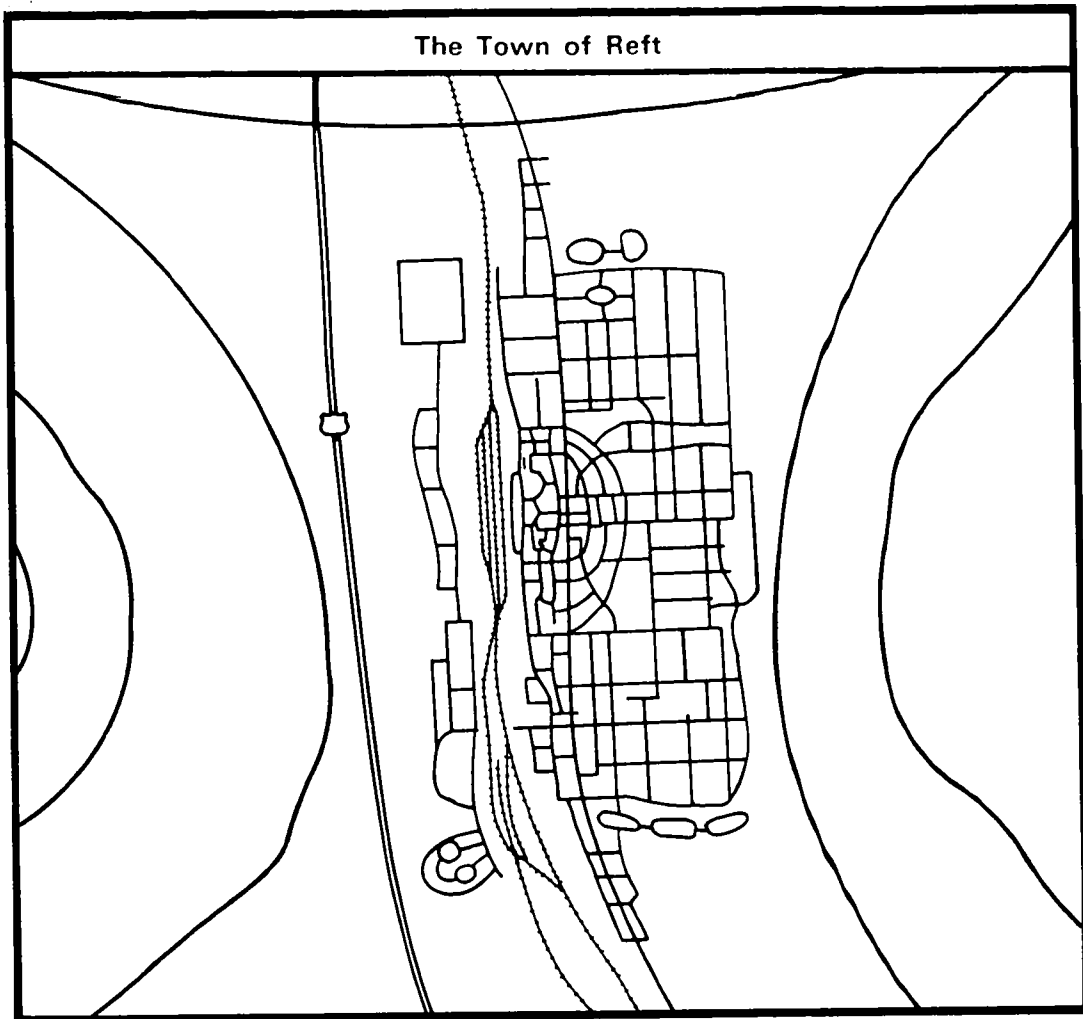


Figure B-13. Example of an urban MCOO development.

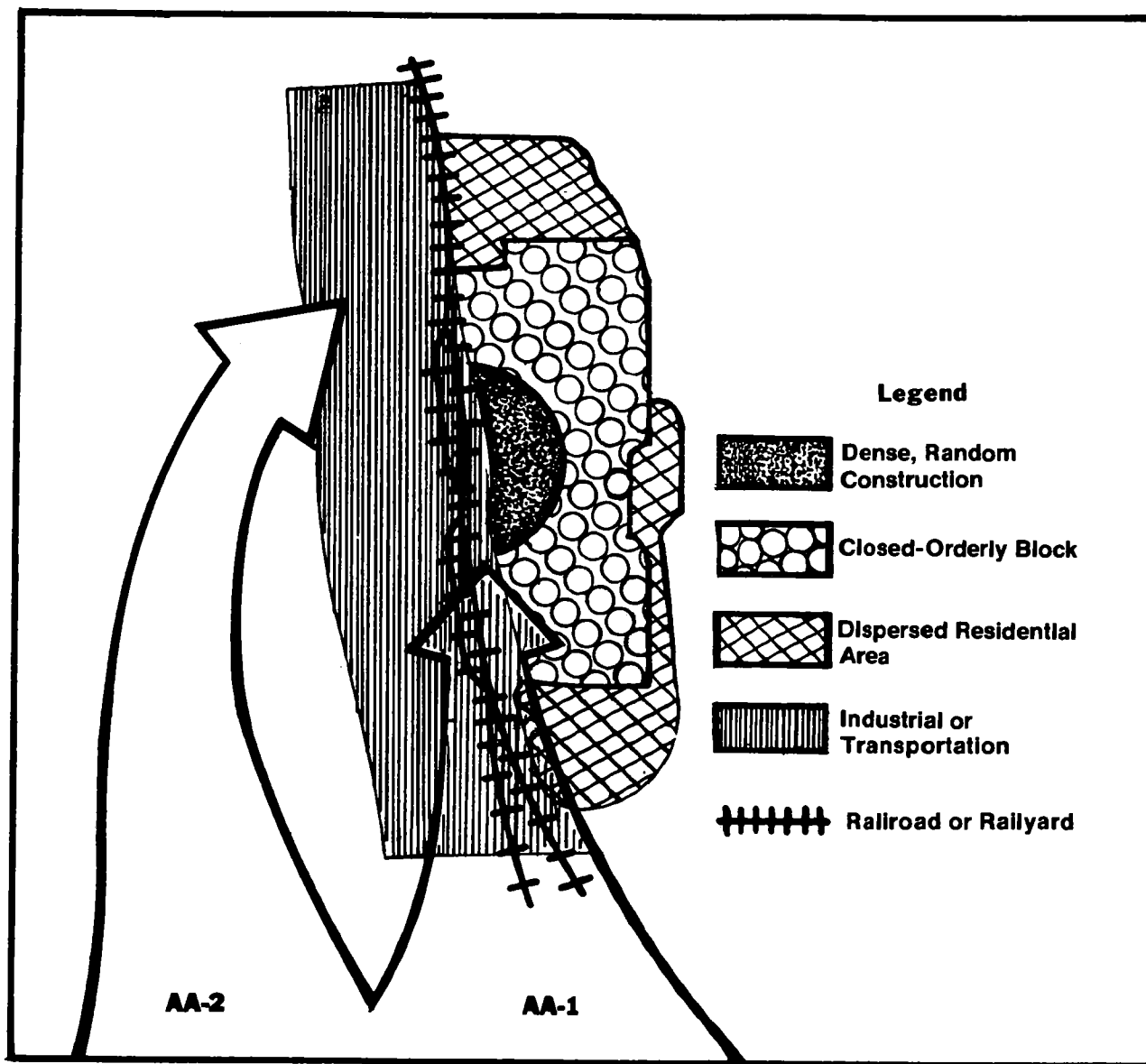


Figure B-14. MCOO for the town of Reft.

An avenue of approach or mobility corridor overlay for urban underground systems should be prepared when appropriate. This is required where the underground systems (sewer, water, subway, gas, steam, or telephone) have pipes, tunnels, or culverts large enough through which an individual can crawl. The overlay should show the size of the tunnels, pipes, and culverts and their approximate orientation. Color coding helps to distinguish systems of various types and sizes. When possible, subsurface avenues of approach or mobility corridors should be prioritized based on the likelihood of their use. Figure B-15 shows an example of an underground systems overlay.

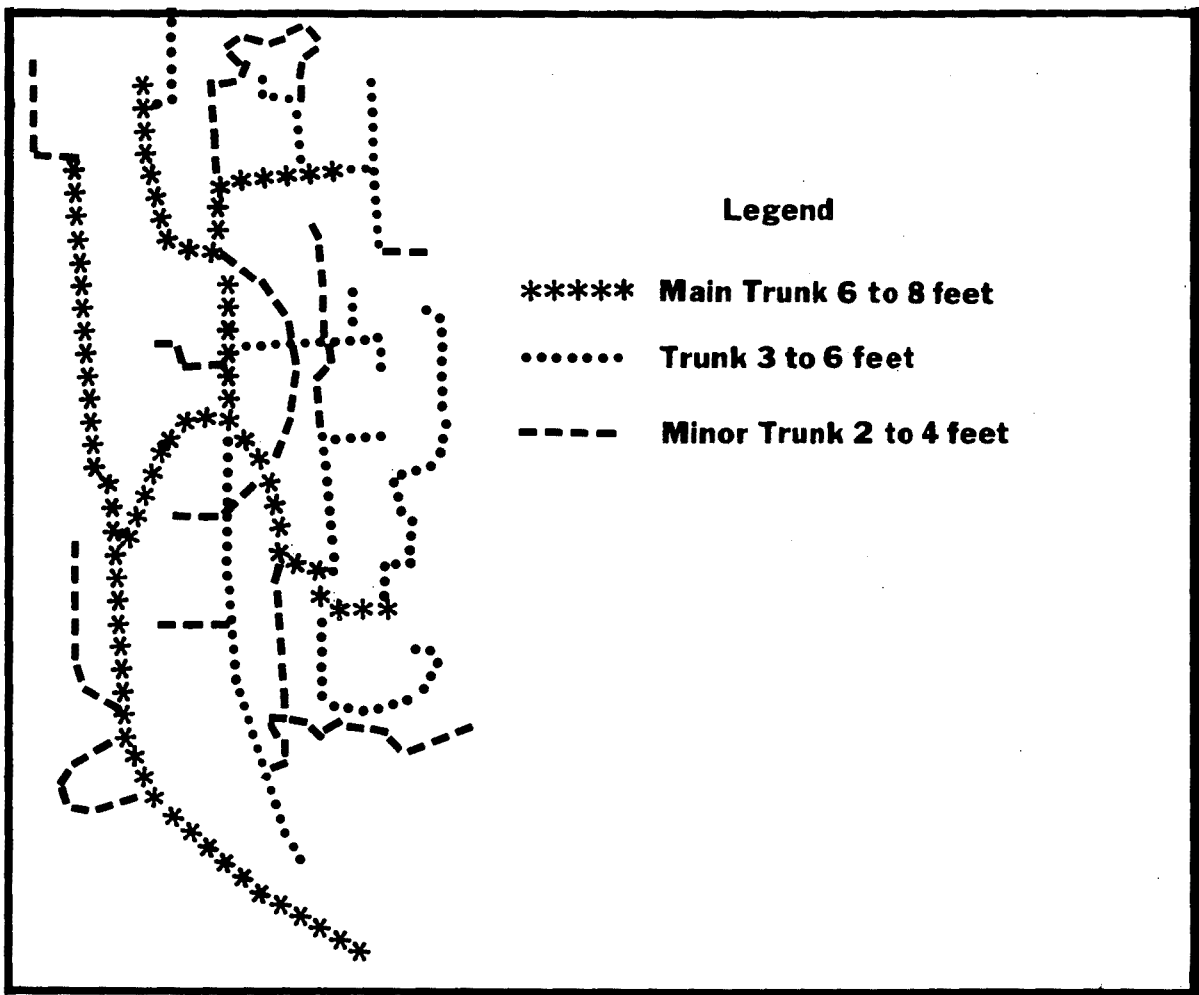


Figure B-15. Example of an underground systems overlay for the town of Reft.

WEATHER ANALYSIS

Weather analysis for urban operations does not differ significantly from open terrain weather analysis. However, a few special considerations peculiar to the urban environment must be taken into account.

Rain or melting snow will often flood basements and subway systems. This is especially true when automatic pumping facilities that normally handle rising water levels are deprived of power. Rain will also make storm and other sewer systems hazardous or impassable. Chemical agents will be washed into underground systems by precipitation. These systems will, as a result, contain agent concentrations much higher than surface areas and will become contaminated hot spots. These effects will become more pronounced as agents are absorbed by brick or unsealed concrete sewer walls.

Many major cities are located along canals or rivers. This often creates a potential for fog in the low-lying areas. Industrial or transportation areas are often the most affected by fog due to their proximity to waterways.

Air inversion layers are common over cities, especially cities which are located in low-lying bowls or in river valleys. Inversion layers trap dust and other pollutants, reducing visibility, and often creating a greenhouse effect which causes a rise in ground and air temperatures.

The heating of buildings during the winter and the reflection and absorption of summer heat make built-up areas warmer than surrounding open areas during both summer and winter. This difference can be as great as 10 to 20 degrees, and can add to the already high logistics requirements of urban combat.

Windchill is not as pronounced in built-up areas. However, the configuration of streets, especially in closed-orderly block and high-rise areas, can cause wind canalization. This increases the effects of the wind on streets which parallel the wind direction, while cross-streets remain relatively well protected.

Light data has a special significance during urban operations. Night and periods of reduced visibility favor surprise, infiltration, detailed reconnaissance, attacks across open areas, the seizure of defended strongpoints, and the reduction of defended obstacles. However, the difficulties of night navigation in restrictive terrain, without reference points, and in close proximity to the enemy, forces reliance on extremely simple maneuver plans with easily recognizable objectives.

THREAT EVALUATION

Threat evaluation for urban combat uses the same three-step process: developing a threat data base, determining enemy capabilities, and developing a doctrinal template file as threat evaluation for open terrain. However, the focus of the evaluation effort is largely directed toward battalion-sized and smaller operations, as units of this size are considered the most effective for urban operations.

The decision for threat forces to attack an urban area may be based on tactical, operational, or political considerations and is normally made at Army level or above. Threat forces may attack built-up areas to--

- Secure political, industrial, logistic, or communications facilities.
- Destroy defending forces within a built-up area.
- Gain passage through an urban area that cannot be bypassed.

While recognizing the requirement to defend built-up areas, threat forces always attempt to establish a defense well forward of an urban area in order to engage and defeat the attacker on the approaches and flanks of the built-up area. Threat forces revert to the conduct of defense within a built-up area only when--

- Attacking forces break through defenses organized forward.
- The built-up area has especially great political, strategic, or economic importance.
- It is necessary to defend a built-up area which is a seaport, or other critical communications or transportation complex.

For both offensive and defensive operations, the threat considers the motorized rifle battalion (MRB) the most effective unit for urban combat because of its inherent mobility, armor protection, and rapid ability to adapt buildings and other structures for defense. The battalion coordinates closely with units from other arms which attach elements or provide support or security. The battalion will be reinforced by other elements depending upon the mission and the expected conditions in the urban area.

During the attack, the MRB is reinforced with a tank company, a battalion of self-propelled artillery for direct fire, an engineer company, and a chemical reconnaissance section. An additional artillery battalion will be placed in direct support to provide indirect fire. Missions normally assigned to an MRB as the first echelon of a main attack are to--

- Seize immediate objectives on the edge of the city.
- Attack along primary routes to secure deep objectives and key facilities.

Figure B-16 shows a doctrinal template for an MRB as the first echelon of a main attack. The battalion assaults in column.

Second echelon MRBs are also reinforced with tanks, artillery, and engineers. This provides for rapid replacement of the first echelon without having to reassign units during combat. Missions normally assigned second-echelon MRBs are to--

- Reinforce the first echelon.
- Be prepared to assume the first-echelon mission.
- Provide replacements for combat ineffective first-echelon units.
- Reduce bypassed enemy defensive positions.

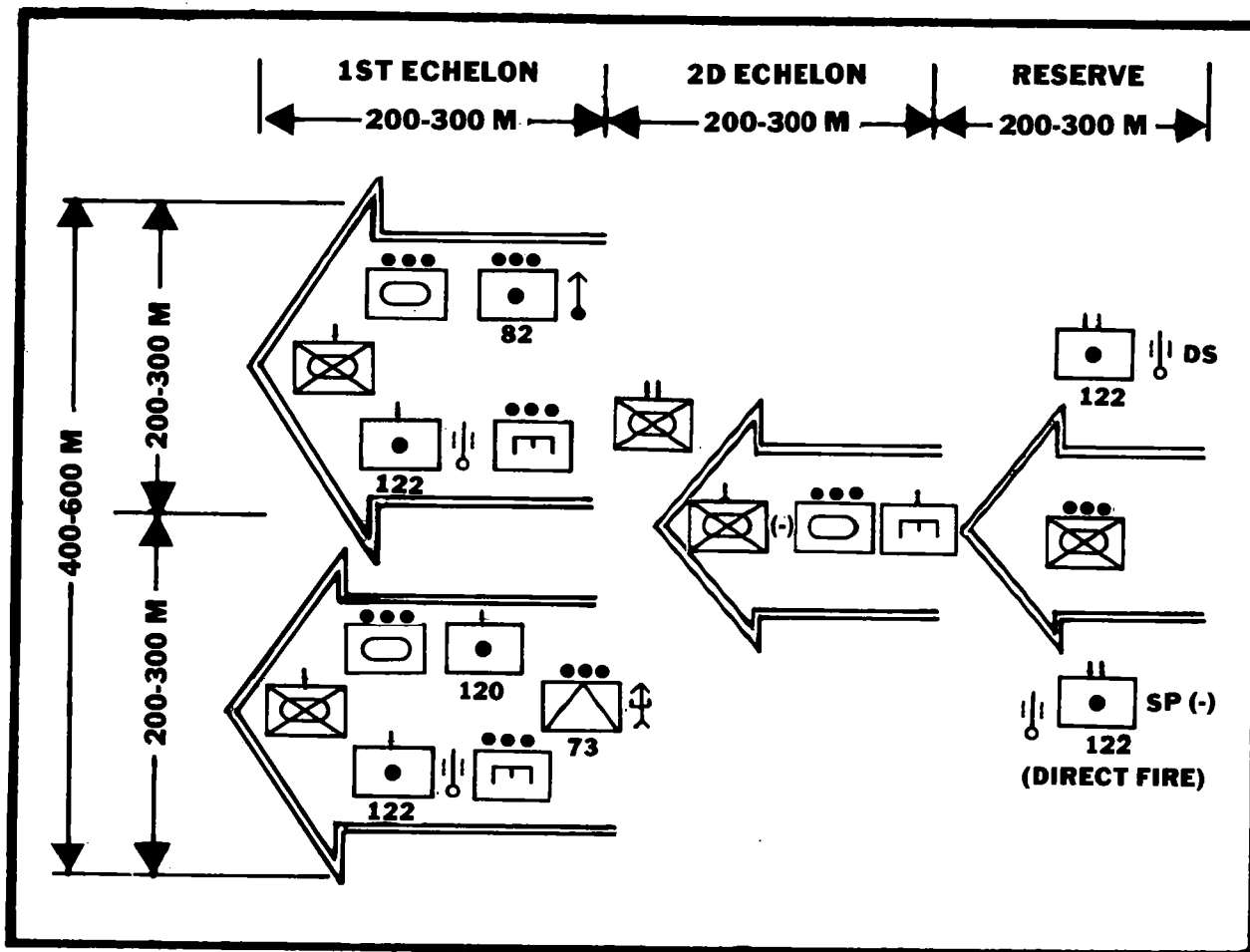


Figure B-16. Example of an attack of built up area by reinforced MRB (main attack).

Reserve MRBs are prepared to--

- Pass through either echelon to exploit defensive weaknesses.
- Protect the flanks.
- Conduct firefighting and debris clearing missions as required.

Motorized rifle companies (MRC) may be designated as assault groups. Companies conducting the main attack are reinforced with a tank platoon, an artillery battery, chemical, and flame thrower units, and an engineer platoon. Frequently, battalion antitank assets will also be attached to the company making the main attack.

Attached elements are further attached to platoons, providing each platoon with at least one tank or artillery weapon and some engineer support. These attachments allow decentralized or independent operations by individual platoons in seizing specific objectives. Figure B-17 shows the doctrinal configuration for a motorized rifle platoon (MRP) assault on an urban strongpoint.

During the defense, the MRB defends as part of the larger regimental-sized unit. It may defend on a main or on a secondary avenue of approach. The battalion may be in the first or second echelon or in the reserve.

The MRB on a main avenue of approach or in the first echelon will--

- Receive the main attack.

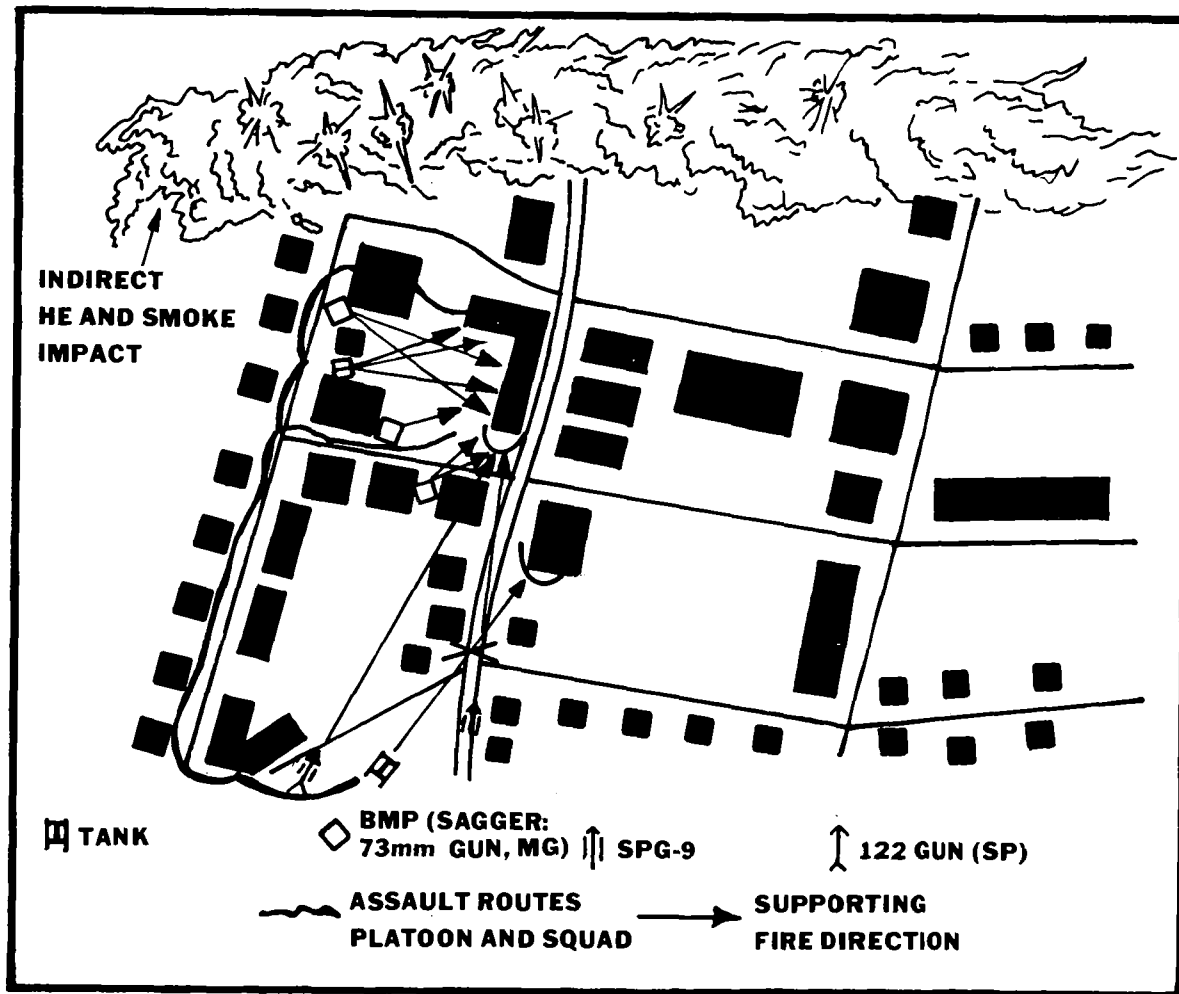


Figure B-17. Example of an MRP assault on an urban strongpoint.

- Inflict decisive damage on the attacking forces to prevent a breakthrough by tanks and infantry.

If the attack penetrates, the MRB must inflict the maximum losses, stop further advance, and create favorable conditions for a counterattack. The MRBs in the first echelon cover a narrower front and receive more reinforcements than those in the second echelon. First echelon battalions are supported by the full regimental artillery group.

As shown in Figure B-18, the MRB in the second echelon, or on a secondary avenue of approach--

- Prevents flanking and rear area attacks.
- Holds defended sites.
- Prevents further advances by an attacking force that has penetrated the built-up area.
- Conducts counterattacks to restore positions of first-echelon battalions.

The reserve--

- Reinforces or replaces first-echelon battalions.
- Covers breaches caused by enemy weapons of mass destruction (chemical and nuclear weapons).
- Holds deep sites whose retention is vital to the overall defense.
- Extinguishes or contains fires that threaten friendly forces or limit operations.
- Conducts rear area security, and counters airlanded forces that are inserted in the rear.

MRB defenses are generally organized into two echelons to provide greater depth and reserves. Company strongpoints are prepared for perimeter defense and form the basis for the battalion defensive position. The reserve is located in a separate strongpoint. Ambush locations are established in the gaps between strongpoints. The rear service areas are selected to capitalize on the concealment and cover afforded by the built-up area. Dummy strongpoints are constructed to deceive the enemy, and positions for securing and defending the entrances to and exits from underground structures and routes are established. Security positions are prepared forward of first-echelon defensive positions. Figure B-19 shows the doctrinal positioning of units or strongpoints within a battalion defensive area.

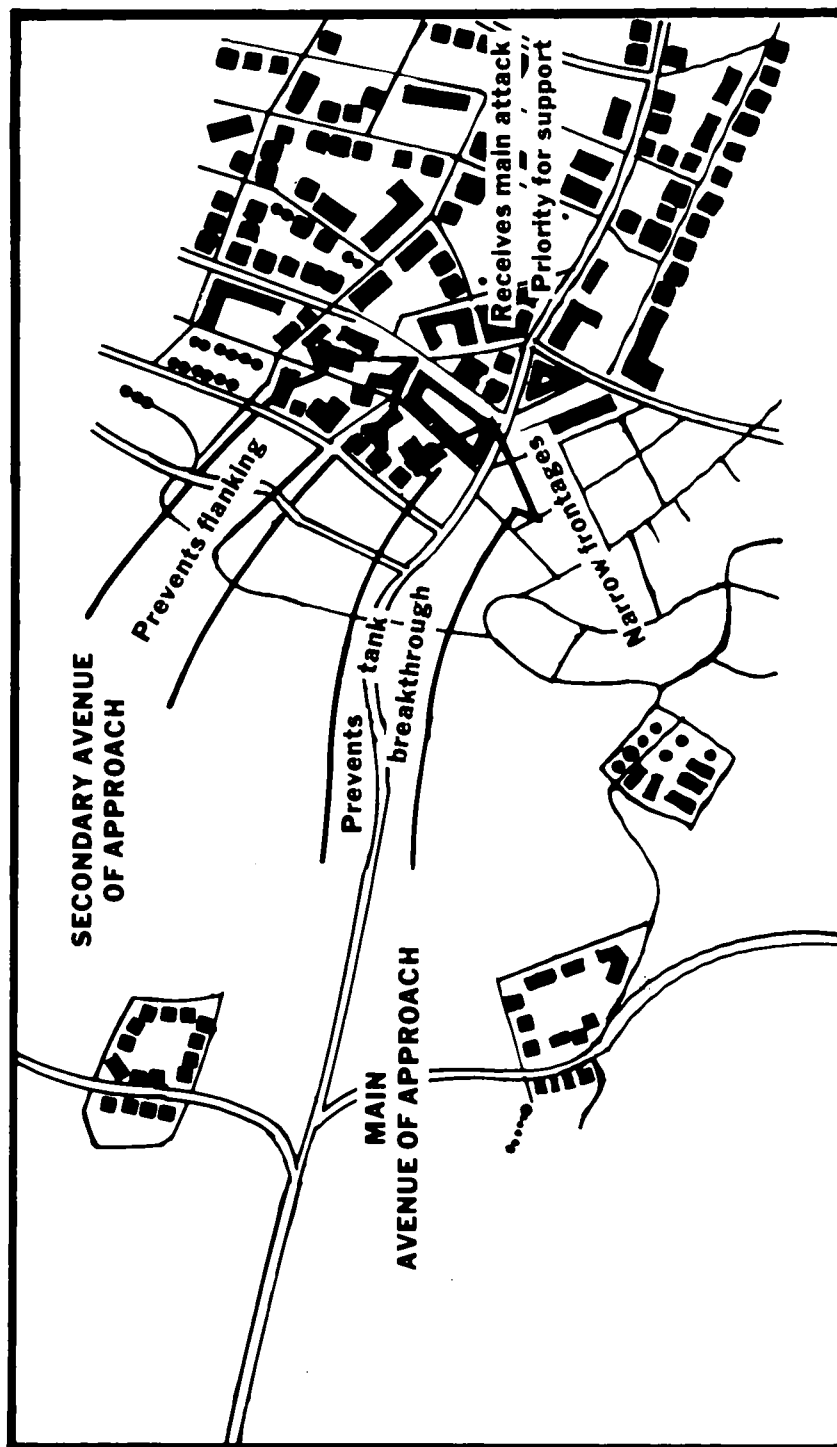


Figure B-18. Example of an MRB in a secondary and main avenue of approach.

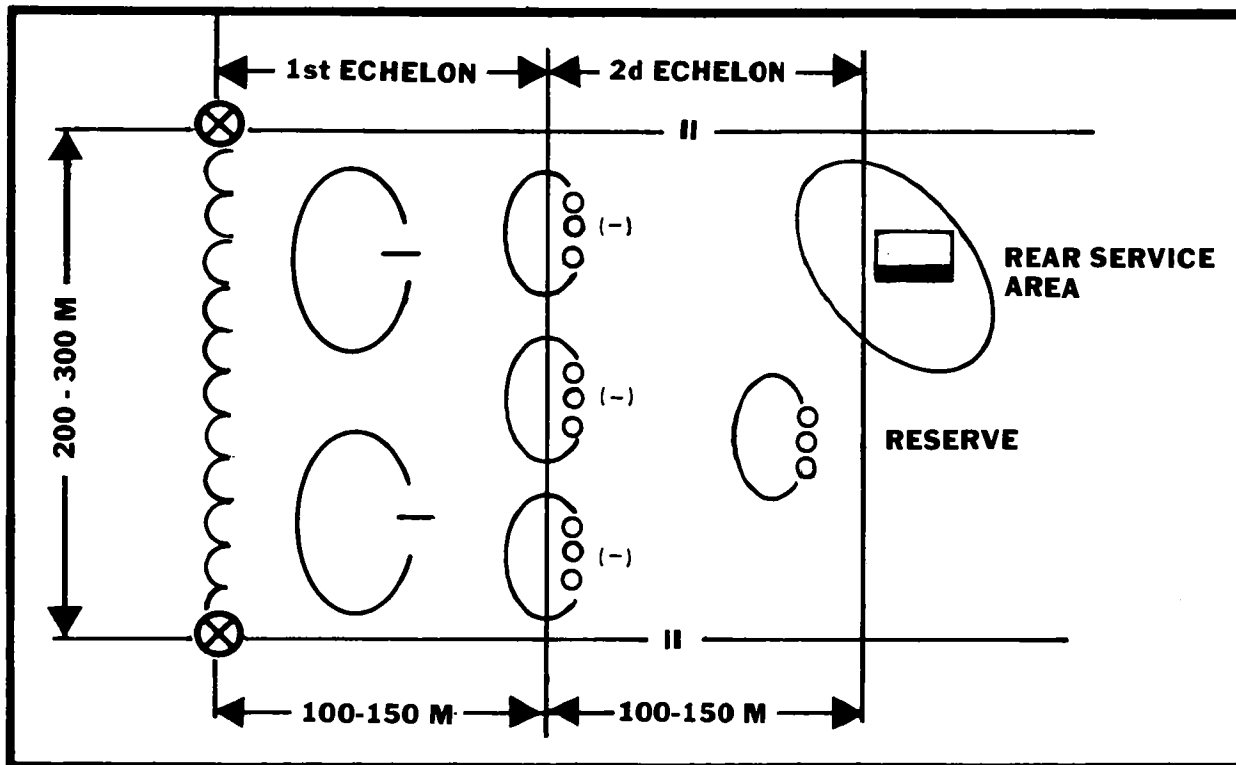


Figure B-19. Battalion defensive area.

Within a built-up area, a company may defend several buildings with mutually supporting fires, or a single large building. Each platoon defends one or two buildings, or one or two floors of the single building.

Strongpoints constitute each defensive position. They are normally prepared in solidly constructed buildings, at intersections, entrances to public parks and squares, or adjacent to bridges. Fires are coordinated between strongpoints and communications trenches are prepared between and within positions. Ambushes are set up in the gaps between defensive positions and structures which impede effective fire are demolished.

Night operations are stressed to maintain uninterrupted momentum and to reduce casualties during the urban battle. Night operations against built-up areas are conducted to--

- Bypass outlying villages being used as defensive positions.
- Seize initial objectives on the edge of the built-up area when required to attack across open ground.

- Attack across broad streets, parks, or between buildings.
- Seize heavily defended strongpoints.
- Reduce street obstacles that are well covered by fires and protected by mines.
- Exploit daylight successes by keeping pressure on the defense.

Reconnaissance units will attempt to infiltrate night objectives to obtain information and to guide assault forces to the objectives. Assault groups normally attack in a single echelon with units deployed online. Supporting fires are withheld until the assault is detected. Once the attack has been detected, artillery illuminates the objective, and attached tanks and artillery suppress defenses with direct fires.

When surprise cannot be achieved, night assaults may be preceded by direct tank and artillery fires. Artillery and mortars seal off the objective to prevent withdrawal or reinforcement. Illumination is used to guide forces, illuminate the objectives, and dazzle night vision devices.

Threat evaluation is similar to that for LIC during urban COIN, counter guerrilla, and counterterrorist operations.

Population status overlays are prepared for the city showing potential neighborhoods or districts where a hostile population may be encountered. Overlays are also prepared showing insurgent or terrorist safe houses, headquarters, known operating areas, contact points, and weapons supply sources. These overlays must include buildings which are known or have the potential to be explosives, ammunition, or weapons storage sites.

Underground routes are of primary concern when considering insurgent and terrorist avenues of approach and LOCs. Sewers, subways, tunnels, cisterns, and basements provide mobility, concealment, cover, and storage sites for insurgents and terrorists. Elevated railways, pedestrian overpasses, rooftops, fire escapes, balconies, and access ladders provide mobility and concealment and can serve as relatively good fighting and sniping positions.

Although doctrinal templates are not developed for urban insurgency and terrorist operations, pattern analysis will reveal how the insurgent or terrorist group operates, and what are its primary targets. Once the group's modus operandi (MO) has been determined, insurgent SITMAPs that pinpoint likely sabotage, kidnap or assassination targets, ambush points, and bombing targets can be developed. When developing these SITMAPs, the following should be considered as primary insurgent and terrorist targets:

- Electric power generation and transmission facilities.
- Gas production and holding facilities.
- Water and sewer pumping and treatment plants.
- Telephone exchanges and facilities.
- Radio and television stations.

THREAT INTEGRATION

Threat integration for the urban battle is accomplished through the development of situation, event, and decision support templates during mid- and high-intensity conflict situations. During LICs and terrorist situations, the DST normally is not developed. A decision support matrix which equates insurgent or terrorist capabilities with potential activities may be prepared. However, it cannot be stressed too heavily that indicators of insurgent or terrorist activity do not necessarily equate to actual insurgent or terrorist operations. It is possible to prepare an insurgent or terrorist decision support matrix which has multiple indicators of activity and to have no actual activity. It is also possible, and quite normal, to have no indicators of activity prior to an operation or for the visible indicators to point to the wrong area or target.

For conventional operations, situation templates, like doctrinal templates, focus on the MRB as the primary urban combat force. However, situation templates for operations down to platoon size may have to be developed. The actual echelon of the force depicted on the situation template will depend on the actual operation and the mission of the friendly unit.

During offensive operations, the MRB attacks in a series of bold, rapid movements along at least one primary route and one secondary route to secure assigned objectives. Buildings are not searched or secured unless resistance is strong. Bypassed defenders are left to following echelons. If the first echelon is stopped or slowed, the following echelon or reserves may be committed around engaged forces, and continue to the objective. Figures B-20 and B-21 provide examples of situation templates for attack along a primary and secondary route and for bypass operations.

Threat urban defensive operations are based on the creation of an echeloned pattern of company and platoon-sized strongpoints. Situation templates of a strongpoint defense focus either on a block of buildings with individual platoon or squad strongpoints in each building, or on a single building with platoon or squad strongpoints on each floor. Strongpoints face main and flanking avenues of approach. The second

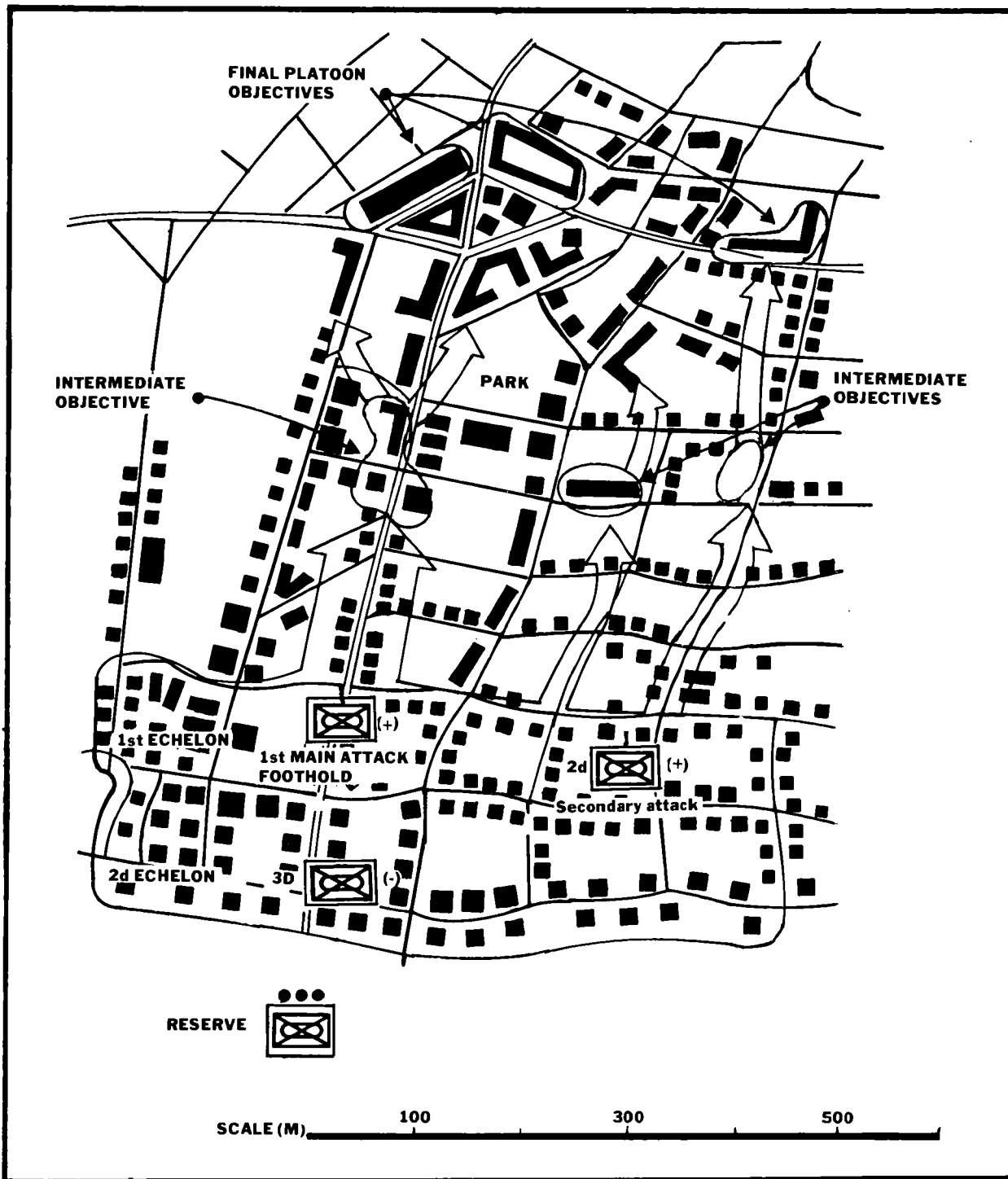


Figure B-20. Example of an MRB attack in a built-up area.

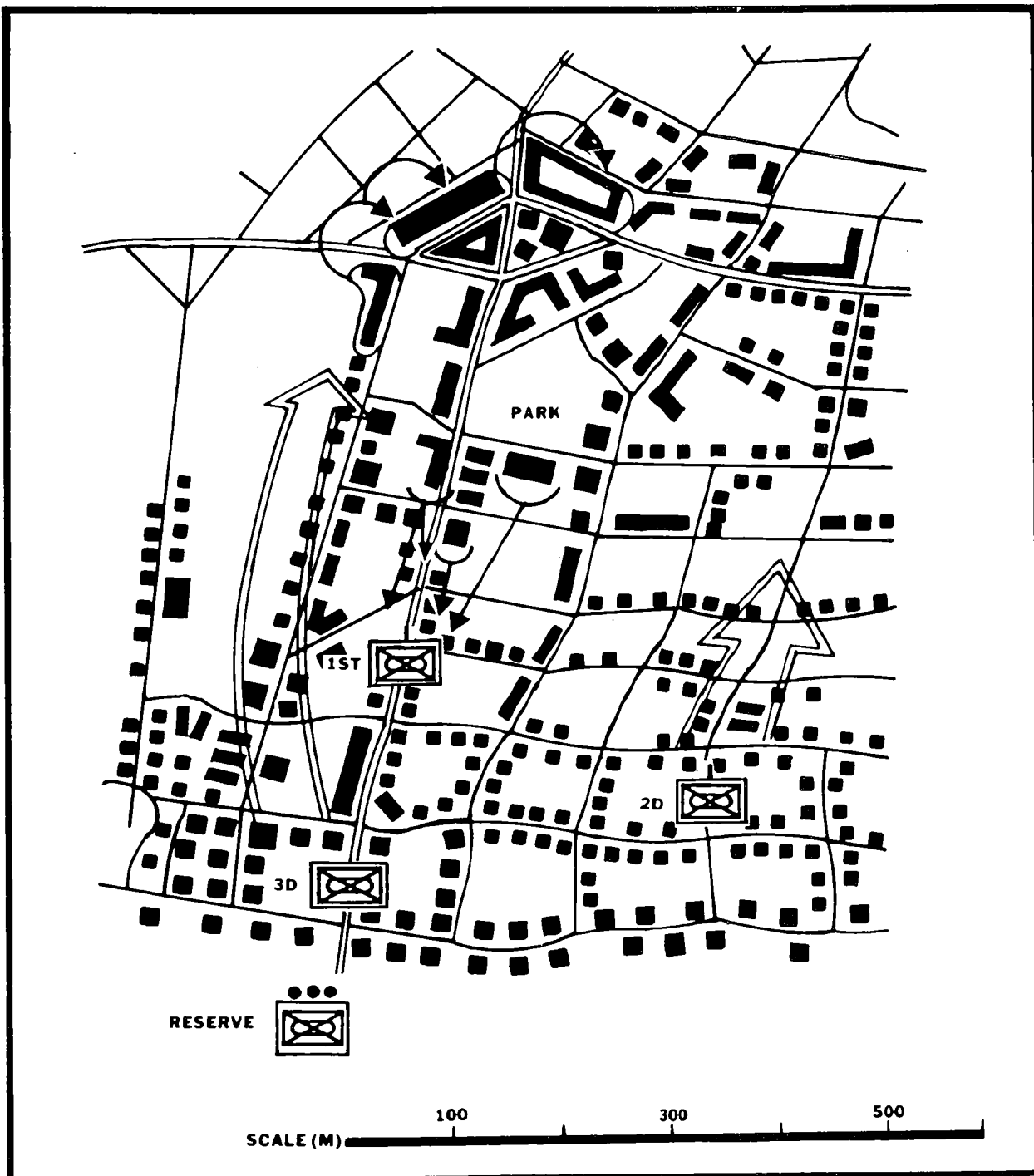


Figure B-21. Example of a 2d echelon committed around engaged 1st echelon.

echelon strongpoints will normally be situated to provide support to both avenues of approach and to prevent further advances. Figure B-22 shows an example of a situation template for an MRB in the defense. Notice that the frontages and depths are only a fraction of what they would be in an open terrain defense.

Situation templating for insurgent or terrorist operations must consider that groups will often conduct multiple operations simultaneously within a given area. Some of these operations may be diversionary, designed to detract attention away from the primary objective. More often, they are designed to force authorities to deal with several incidents at once, thus creating the illusion that they are unable to cope with the situation.

Event templating for urban operations must be keyed to terrain, as keying NAIs to actual events has limited utility in a slow-moving urban battle.

During enemy offensive operations, event templating must focus on the enemy's attack routes, where and when the second echelon will probably be committed, and how the second echelon will attempt to bypass stalled first-echelon elements. Because NAIs may be individual buildings, they may be closer together than in normal open-country operations. However, they perform the same functions of confirming or denying an enemy course of action and serving as the basis for directing the collection effort. Troops in contact, scouts, patrols, agents, line-crossers, and interrogators are often the most effective collection assets in the urban battle, although timeliness becomes a factor. Together with aircraft, these assets are a primary consideration when developing NAIs for urban operations. Figure B-23 is an example of an urban battle event template for an enemy attack.

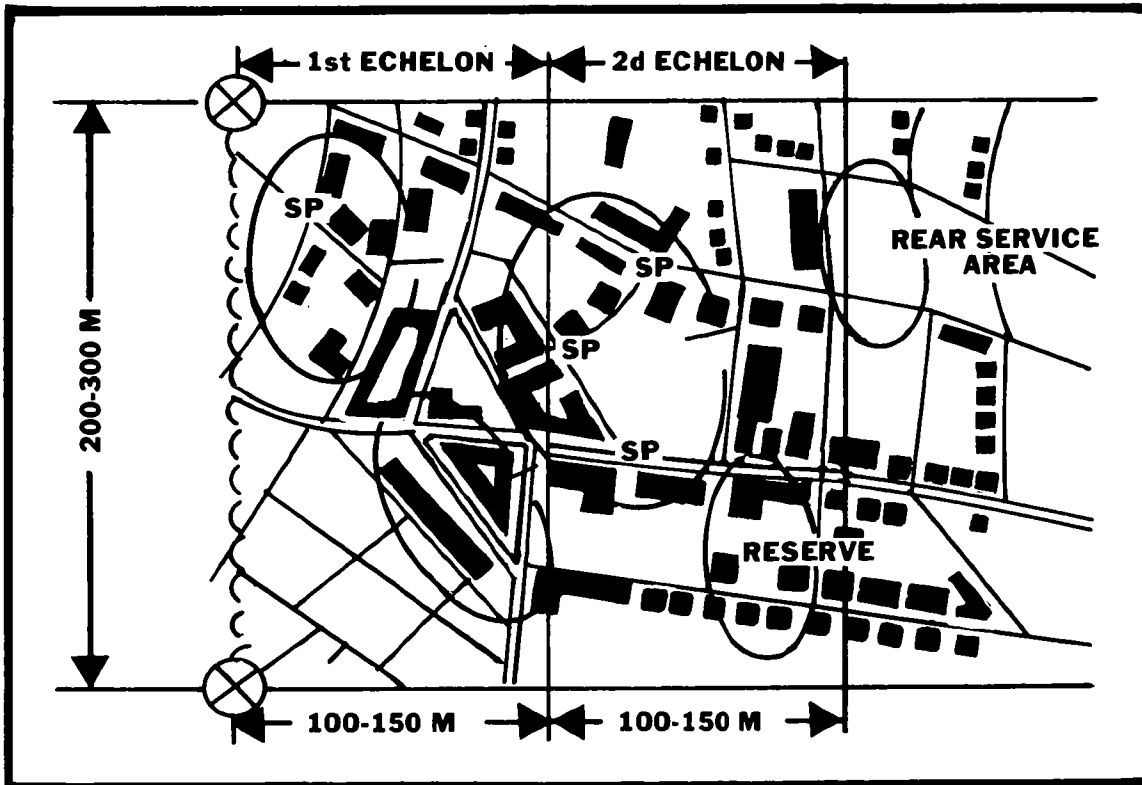


Figure B-22. Example of a situation template for an MRB in the defense.

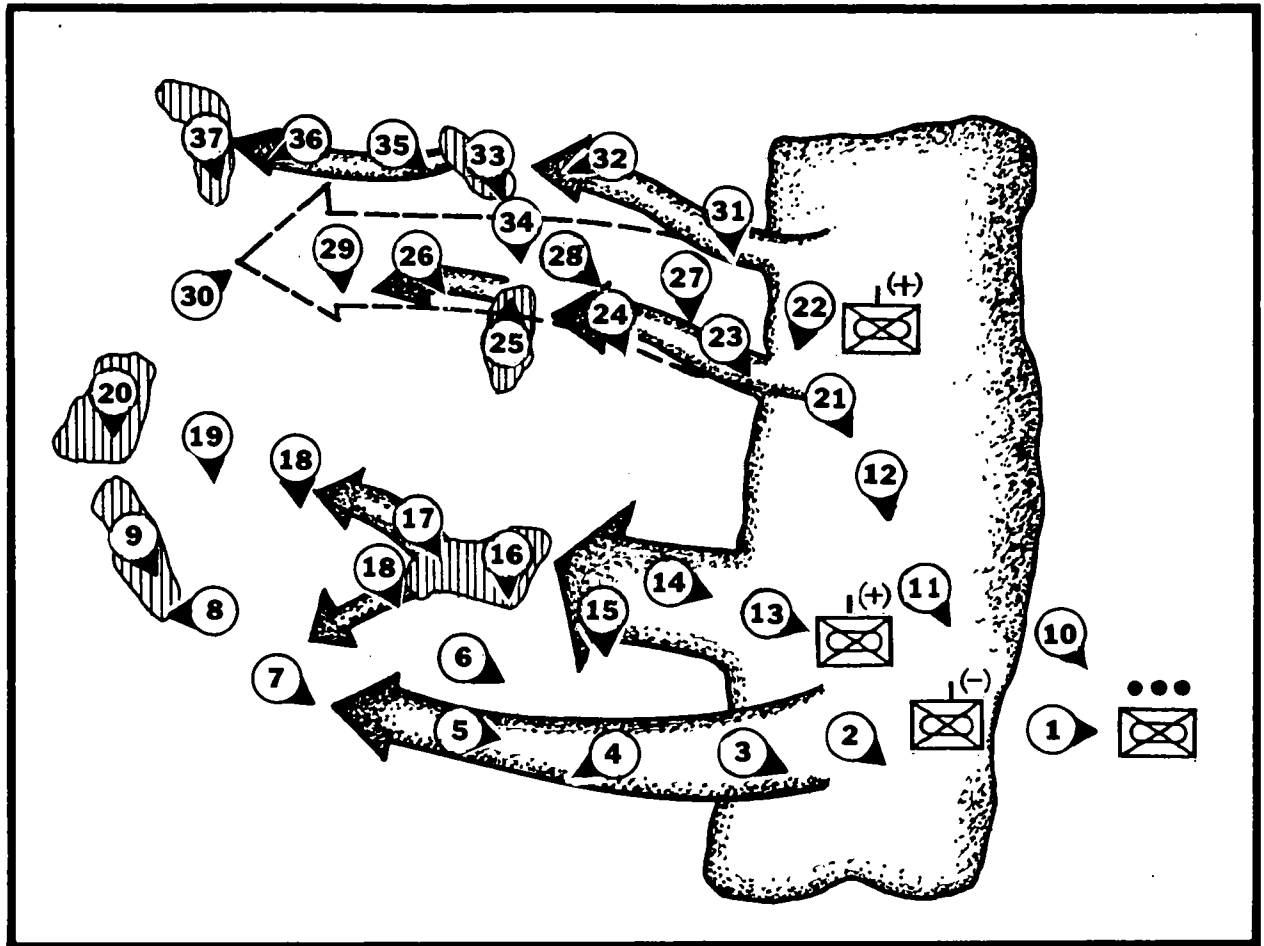


Figure B-23. Example of an urban battle event template.

DSTs for urban operations must be the direct result of wargaming. As with situation and event templates, the DST will normally deal with an area less than 1,000 meters square. As it normally covers a relatively small area and deals with exceptionally slow-paced operations, the DSTs will only rarely rely on TPLs to key decisions. However, cross streets which run perpendicular to the axis of advance may take the place of TPLs. Street intersections, open areas, or individual buildings may also serve as DPs, especially when street patterns are not rectangular. DPs must consider the slower pace of urban operations, and not be placed too far in advance or too close to the TAI to which they are keyed.

It is exceptionally critical to prepare an enemy DST for urban operations. The restrictive nature of the terrain limits freedom of action to such an extent that the commander must be able to determine enemy options at a glance. When possible, the enemy DST should be developed on, or as an overlay to the friendly DST. It is also possible to develop a combined friendly and enemy DST and operating factors matrix with decisions or counterdecisions keyed to points, events, or TPLs. As night operations are heavily stressed to achieve surprise in urban warfare, the analyst may consider developing separate DSTs for day and night operations. Factors to consider when developing night DSTs are--

- Infiltration.
- Increased reconnaissance.
- A generally more rapid pace of operations.
- A reliance on stealth and illumination.

Figure B-24 shows an example of a friendly DST (enemy attack). Figure B-25 shows an example of an enemy DST.

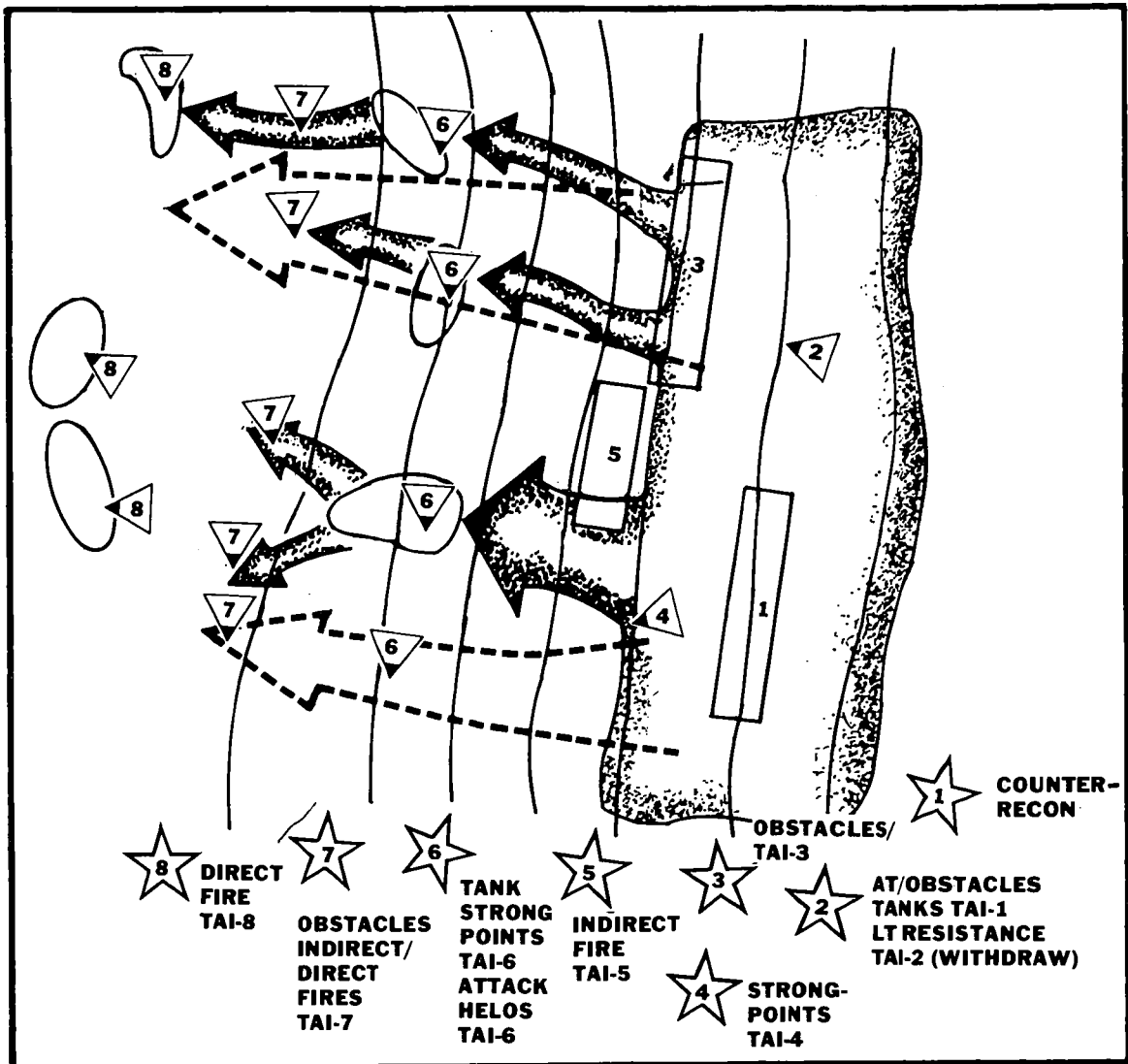


Figure B-24. Example of a friendly DST (enemy attack).

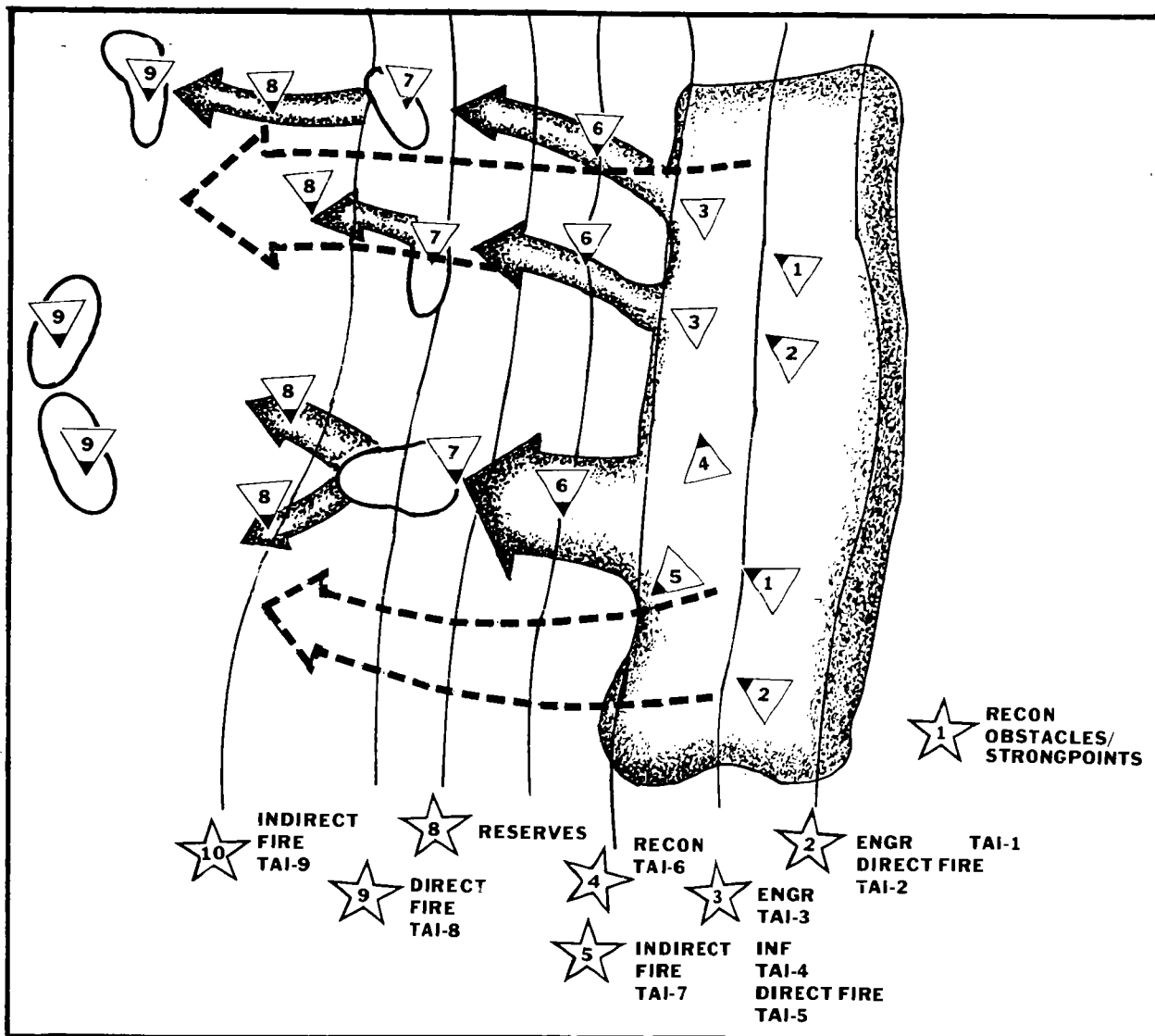


Figure B-25. Example of an enemy DST.

APPENDIX C

INTELLIGENCE PREPARATION OF THE BATTLEFIELD IN AIR DEFENSE, COUNTERAIR, AND AIR OPERATIONS

The modern battlefield must be considered in three dimensions: width, depth, and airspace. Width and depth have traditionally been considered during operations and emphasized in the IPB process. However, the growing enemy air, airborne, air assault, and SPETSNAZ threat, together with the increased friendly force reliance on air support and mobility, have dictated that the battlefield be viewed in terms of a third dimension--airspace.

Historians have always viewed the air battlefield as the most difficult area to analyze because of the transitory nature of airspace events. Before the rise of aviation, battlefields had always been viewed in terms of square kilometers. Since the addition of the airplane and helicopter to the arsenal of war, the battlefield must now be viewed in terms of cubic kilometers. Airspace itself has no reference points to guide the analyst, and all evidence of air activity is erased seconds after the activity occurs. Airspace analysis must therefore tie air events to time and to the ground. Because of this requirement, it is often difficult to establish NAIs, TAIs, and air operations DPs. It is therefore critical that aircraft maximum service ceilings, minimum operating altitudes for both fixed and rotary-wing aircraft, and the maximum effective ranges of air defense weapons systems be integrated into airspace analysis.

Although terrain and weather will dictate available air avenues of approach, to a degree, a detailed knowledge of fixed and rotary-wing attack profiles is basic to air-associated IPB. The avenue of approach for attack helicopters employing a LO-LO-HI attack profile will differ significantly from that of a high speed fighter-bomber flying a similar profile. The same avenue of approach will differ even more significantly if the fighter-bomber shifts to a HI-HI-LO profile. The analyst and the commander must therefore be acutely aware that as aircraft have been developed, terrain has been considered. Attack profiles have been developed to provide the aircraft with a substantial advantage.

As the commanders are forced to consider all aspects of aviation operations, they must be aware of friendly and enemy airlift, airborne, air assault, air insertion, and air defense capabilities and limitations. They receive support in this area from air defense officers at all echelons and levels.

Serving as the air-associated IPB coordinator at all levels, the G2 or S2 must rely heavily on the air defense and aviation officers to supplement the knowledge of aviation capabilities and air defense unit deployment. It is therefore critical that both the aviation and the air defense officers have at least the same level of IPB knowledge as the G2 or S2 for their functional areas. It is also critical that both air defense and intelligence personnel have the same level of knowledge of the air threat, and that aviation and intelligence personnel have the same

degree of knowledge on the air defense threat. It is especially critical for the air defense and the aviation officers to participate in the IPB staff integration process within the unit CP, and to assist in the refinement of the airspace analysis and air operations process.

IPB for air defense, CAS, and other aviation-related operations is neither difficult nor significantly different from IPB for other types of operations, provided the effort is based on a thorough understanding of the third battlefield dimension. The basic process remains the same. However, the focus of the effort must shift to cover the air space involved and the extremely fluid nature of the air space medium. IPB of the third dimension is but one part of the total IPB picture. It is important to remember that air-associated IPB cannot be treated as a separate product from ground IPB. The threat will use air assets to complement ground force operations. As such, air and ground IPB complement each other and must be integrated.

BATTLEFIELD AREA EVALUATION

The evaluation of the third dimension is conducted from a different perspective than that done for ground IPB. Terrain and weather have entirely different effects on aviation operations. This is especially true regarding weather effects. The enemy forces that must be evaluated in relation to the weather, terrain, and friendly mission include aircraft (fixed and rotary-wing), air defense weapons systems, air-to-surface and cruise missile systems, airborne and air assault units, and special purpose forces. The commander and intelligence staff may also wish to consider the capabilities of enemy tactical SSM systems when conducting airspace analysis, as these systems are affected by many of the same operational constraints as aircraft and ADA systems.

The commander must also evaluate the capabilities of friendly aircraft, air defense systems, and cruise missile systems to operate within the battlefield environment. This evaluation is more complex because the friendly technological advantage (somewhat negated in the newest threat aircraft), and the better training of friendly pilots and crews, increases the capabilities of these systems over comparable threat systems.

Although commanders must be concerned with the entire spectrum of air threat, they will be most concerned with the tactical air and air-associated assets organic to enemy divisions, armies, and fronts. Operational and strategic assets from the air armies in support of the theaters of military operations (TVD), and those assets subordinate to the Supreme High Command (VGK), will be considered only when employed in support of operational-tactical operations. However, these strategic assets will be considered during airspace analysis at the operational level of war.

The third dimension of the battlefield includes the air AO and the air AI. The air AO, like the ground AO, is the area where the commander is assigned responsibility and authority for military operations. It is

identical to the ground AO when considering the placement of ground-based systems, but is limited only by maximum and minimum aircraft operating altitudes and the maximum effective ranges and altitudes of air defense weapons when considering actual airspace.

The air AI includes airspace adjacent to the air AO and extends into enemy airspace. The air AI is normally much larger than the ground AI due to the great distances aircraft can rapidly cover. The air AI extends upward to the maximum service ceiling of enemy aircraft and the maximum effective altitude of enemy air defense weapons systems. The air AI may also extend as far as enemy airfields and to the maximum range of enemy surface-to-surface missile systems. Figure C-1 shows the air AO and AI. Figure C-2 shows the maximum effective altitudes of major Soviet SAM systems.

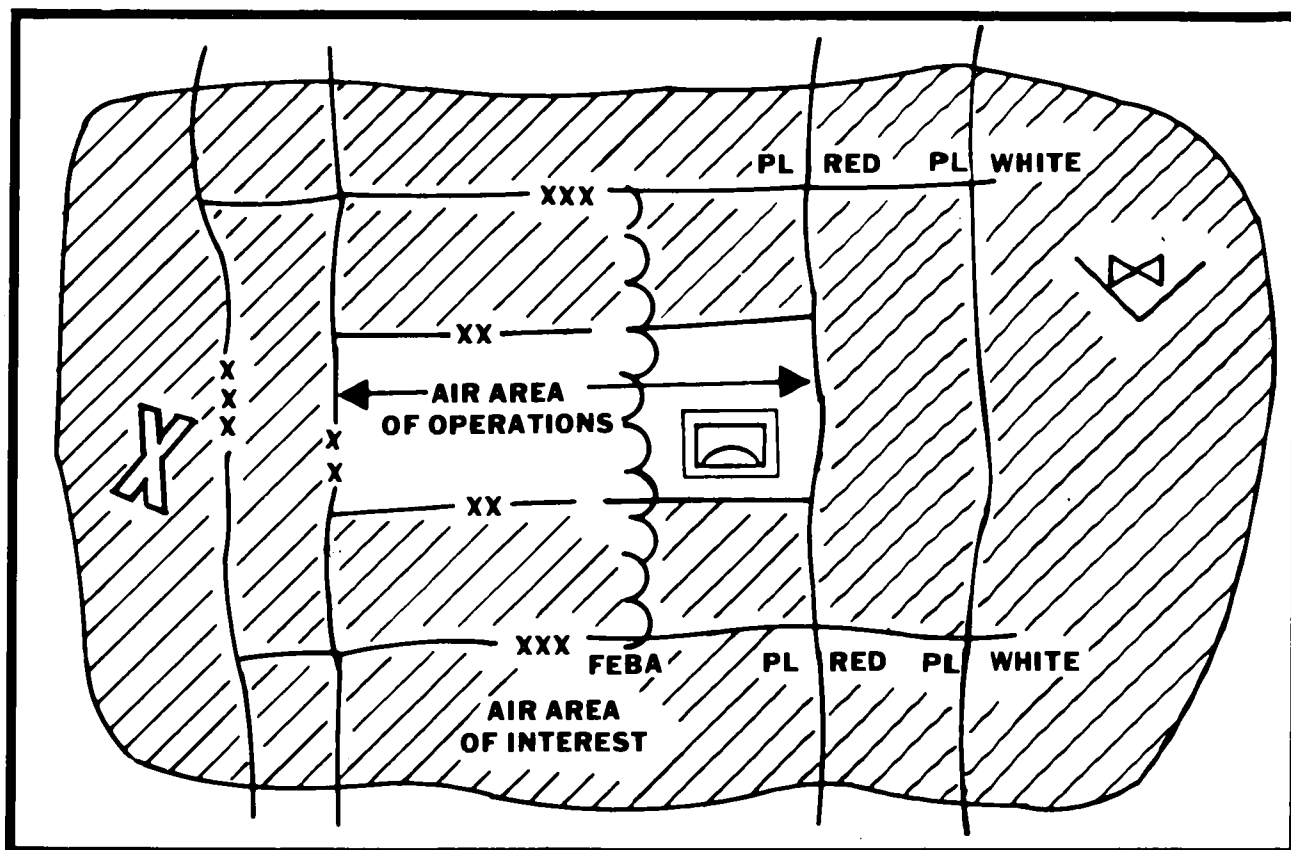


Figure C-1. Air AO and AI.

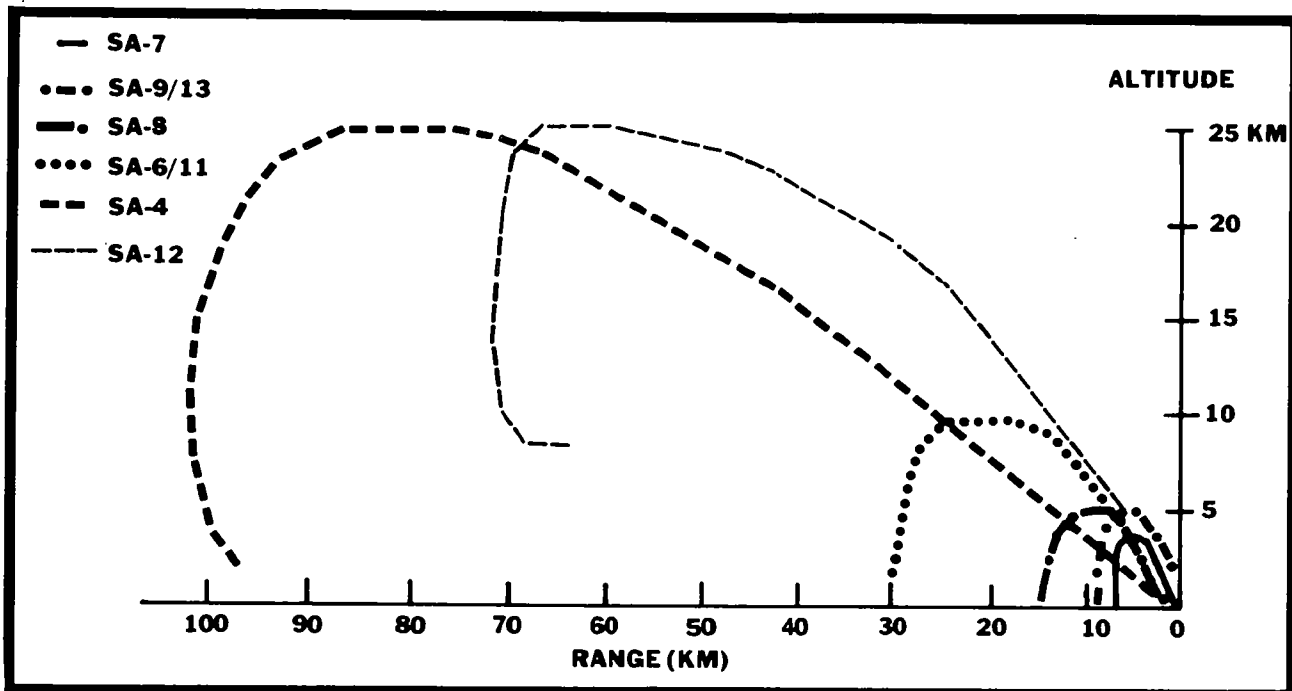


Figure C-2. SAM effective ranges.

TERRAIN ANALYSIS

Terrain analysis in support of air defense, counterair, and other air-associated operations is significantly different from terrain analysis for ground operations. The analyst is dealing with a medium that extends several thousand meters AGL, and with forces whose mobility is limited only by their ability to operate within this medium. The nature of airspace does not eliminate the need for terrain analysis because aircraft and air defense elements will still attempt to use the terrain to their own best advantage. In fact, it is probably accurate to say that third dimension analysis (airspace) relies as much on terrain analysis as does the ground IPB effort.

Standard military topographic maps are not normally considered suitable for other than the most basic airspace analysis. Standard 1:50,000 scale topographic maps are most useful when analyzing the ability of an aircraft to approach, acquire, and engage a target. This analysis produces an aircraft's approach to target. Detailed analysis of air avenues of approach (from air base to target vicinity), or of enemy air corridors should be conducted using standard 1:250,000 scale Joint Operations Graphic (JOG) specifically designed for this purpose. These are available in JOG-R (Radar), JOG-A (Air), and JOG-G (Ground) production series. Specifically--

- JOG-R is considered to be the most accurate, and is the preferred graphic for airspace analysis.
- JOG-A is the preferred graphic when the JOG-R is unavailable.
- JOG-G is not sufficiently accurate for airspace analysis and should be used only when JOG-R, JOG-A, or air traffic control (ATC) charts cannot be procured.

Due to the production limitations of the DMA, JOG-series graphics for all potential operating areas are not available. Units which are required to operate in areas where JOG maps are unavailable should obtain nonstandard 1:200,000 scale ATC charts for airspace analysis through aviation or DMA channels. Under no circumstances should nonstandard air navigation charts be used for airspace analysis.

As with ground IPB, the intelligence staff receives support from the engineer terrain team during airspace analysis. However, this support must be augmented by personnel from other functional areas with an understanding of the air threat, air defense systems and operations, and CAS techniques.

This additional support is provided by the air defense officer, the aviation officer, the division or corps G3 air officer, the Division Airspace Management Element (DAME) and Corps Airspace Management Element (CAME), air cavalry troop commander, and the USAF FAC. Each of these individuals is required to view the terrain regarding its potential effects on the respective functional area and can, therefore, contribute to the terrain analysis process through application of their specific knowledge.

Terrain analysis for air operations focuses on the same military aspects of terrain as ground operations. However, the analysis of these aspects is directed first at their effects on airspace operations, and then on their resultant effects on the overall operation.

OBSERVATION AND FIELDS OF FIRE

As with ground operations, observation involves the effects of the terrain on R&S and target acquisition. Foff involves the effects of terrain on weapons effectiveness. In air defense, both counterair and other air operations are closely related to LOS. Ground operations are concerned primarily with horizontal LOS. Air and air-associated operations are primarily concerned with air and ground oblique and vertical LOS. Figures C-3 and C-4 show oblique LOS for ground and air. Figure C-5 shows a vertical LOS.

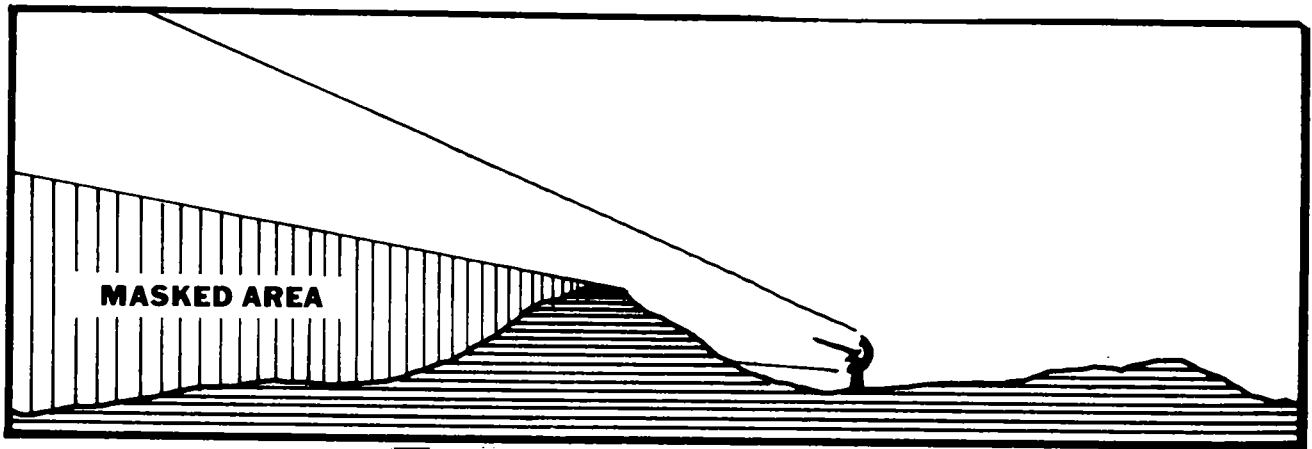


Figure C-3. Oblique LOS (ground).

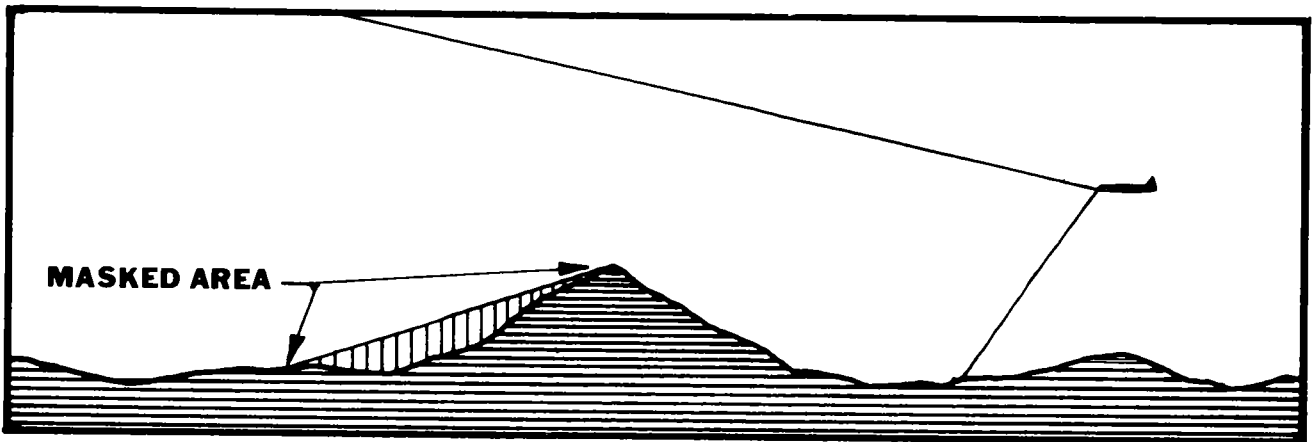


Figure C-4. Oblique LOS (air).

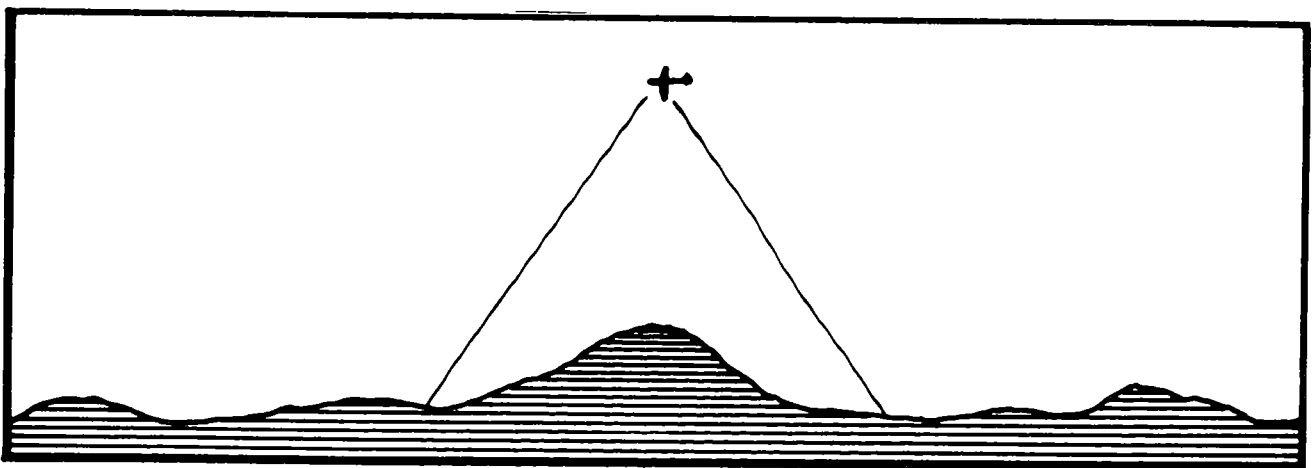


Figure C-5. Vertical LOS.

Air defense target acquisition and weapons systems require LOS from their positions to the air target's primary avenue of approach. Aircraft require electronic or visual LOS to acquire and attack their targets. Aircraft carrying airborne and air assault forces require LOS to ground reference points and to their DZs or LZs to safely and accurately deliver these forces. Areas that provide LOS observation and Foff in excess of 4,000 meters should be considered primary operating areas for helicopter-launched wire, radio frequency, and command-guided ATGMs, and for threat antitank systems capable of being employed in an anti-helicopter role.

Observation plays a key role in the selection of air assault LZs, airborne DZs, and FARPs. LZs and DZs require good air LOS access for the accurate placement of forces. However, as the zones themselves are open and provide excellent Foff, the areas selected should be obscured from observation and from the effects of direct fire weapons by terrain features, smoke and obscurants, vertical obstacles such as vegetation, or by built-up areas. This is especially critical if a time is required for consolidation on the LZ or DZ before the force moves against its objective.

FARPs for fixed and rotary-wing aircraft present a similar problem. They must be large enough to support FARP operations, have good LOS access to allow aircraft to enter and leave the area rapidly, and be situated to provide protection for aircraft during approaches and while on the ground. Finally, FARPs should be situated to provide as much protection as possible from detection by R&S assets and from engagement by indirect fire.

Both attack aircraft and air defense assets want as much protection as possible from enemy observation, and both require direct LOS to the target. It is, therefore, necessary to analyze battlefield airspace regarding the routes which provide the best protection for aircraft entering the target area and those which provide the best Foff for the aircraft once it reaches the target area. Similarly, the analysis must consider where air defense assets can best be hidden from observation, and retain good Foff against the primary air avenues of approach and mobility corridors.

CONCEALMENT AND COVER

Many of the air-related aspects of concealment and cover have been discussed under observation and Foff. Friendly force operations require cover from aerial direct fires, especially antitank fires, and concealment from aerial R&S. Similarly, the enemy will attempt to use terrain to provide cover from direct fires and to conceal their operations from friendly R&S.

Rotary-wing (and some fixed-wing) attack aircraft will attempt to use the terrain for cover from direct fire and to conceal their presence by

loitering on the reverse slopes of hills, and employing pop-up tactics to acquire and engage targets. Rotary-wing aircraft will also attempt to use vegetation as a backdrop to enhance aircraft camouflage. Fixed-wing attack aircraft will attempt to fly as low as possible to maximize the effects of aircraft camouflage, to best use their great speeds to negate enemy air defense target acquisition and to become lost in the ground clutter of what is referred to as "look down-shoot down" radar systems. All types of aircraft will attempt to use masked areas to prevent detection by visual observation, target acquisition systems, and air defense weapons. When feasible, aircraft will attempt to blind observers by attacking out of the sun. This tactic is most often used by high performance counterair aircraft.

While not considered as either concealment or cover in the strictest sense, NOE flight enhances both fixed and rotary-wing aircraft survivability. An NOE flight makes the optimum use of available terrain for concealment and cover, and hinders quick countering responses by ground forces and air defense assets.

Air LZs and DZs, especially small unit LZ or DZs, require concealment from observation and at least some measure of cover from the effects of indirect fires. Airborne and air assault forces require adequate concealment to hide movement away from the LZ and DZ, and sufficient cover to protect them from indirect and direct fires during movement to their objectives.

FARPs require adequate concealment to prevent their detection by R&S assets, and adequate cover from indirect fires. The latter is especially critical due to the extreme vulnerability of aircraft while on the ground and the open storage of aircraft fuels and ammunition at the FARP. Concealment is also critical when evaluating ground approaches or LOCs to a FARP. FARPs cannot be placed in terrain where reconnaissance or maneuver assets can approach undetected, nor in terrain so open that logistics activities that support the FARP become readily apparent. FARPs should not be placed where they will negate effective air defense coverage.

OBSTACLES

Normally, three types of obstacles are considered during airspace analysis. They include--

- Obstacles to the effective employment of air defense target acquisition or weapons systems.
- Obstacles which restrict NOE flight (below 22.8 meters, or 75 feet in height).
- Obstacles which force aircraft to employ a particular profile or attack route or to gain excessive altitude (above 22.8 meters in height).

Obstacles to the effective employment of air defense target acquisition or weapons systems include terrain which masks LOS, built-up areas (especially areas with tall buildings), and vegetation. Another major obstacle to the effective employment of an air defense system is the maximum effective range of the system itself. Thus, when considering obstacles during airspace analysis, the analyst must consider that air defense systems require LOS to the target and overlapping coverage of the target area.

Obstacles which restrict NOE flight include tall trees, radio, television and microwave relay towers, power transmission lines, support towers, smoke and obscurants, and tall buildings. The capabilities of aircraft terrain-avoidance radars restrict high-performance aircraft and cruise missile NOE flight, and while not an obstacle in the strictest sense, dictate the minimum attack altitude and the maximum aircraft attack speed.

A low-level obstacle that promotes NOE flight is the electronic ground clutter created when an aircraft flies near the ground. Again, although not an obstacle in the strictest sense, ground clutter can effectively conceal aircraft from air defense systems and from other aircraft not equipped with sophisticated look down-shoot down radars. Ground clutter is normally at its worst in heavily forested areas.

Obstacles that force aircraft to gain excessive altitude or to adopt a particular attack profile or attack route include mountains, large hill masses, built-up areas, and excessively tall trees. Of particular interest are obstacles which restrict lateral movement within the air avenue of approach or mobility corridor. These obstacles have the same effect on aircraft as ground obstacles; that is, canalizing movement and restricting evasive action. They often become key terrain for the employment of air defense weapons systems. A key obstacle to aircraft movement is the service ceiling of the aircraft itself. This is particularly true in the case of rotary-wing aircraft which have low-service ceilings. Major terrain features often force rotary-wing aircraft to use valleys for their approach to the target, again canalizing movement and restricting maneuver. A final obstacle to aircraft movement is certain types of ordnance require a minimum release altitude or attack profile.

Obstacles which should be considered during airborne and air assault operations include flooded areas, areas with second-growth timber, and areas where the enemy has placed synthetic antilanding obstacles such as posts, dragons teeth, and shallow crisscross ditches. Jungle clearings often appear to be ideal LZs or DZs. However, these areas often have exceptionally tall grass which deceives the observer as to the actual ground height. This situation creates an unexpected drop of between 8 and 12 feet for troops descending by parachute or exiting an aircraft.

The final obstacle that must be considered when conducting airspace analysis is the actual soil composition of the ground environment. Excessive amounts of blowing dust and sand can severely damage aircraft

engines, as can small stones drawn into engine intakes. Thus, the soil in an area can impose special maintenance, logistics, and operational constraints on aviation operations.

KEY TERRAIN

Key terrain in airspace analysis is any terrain feature which allows air defense weapons to engage canalized or constrained air or airborne forces. Areas that limit aircraft lateral movement, restrict air maneuver, or have elevations higher than maximum aircraft service ceilings should also be considered key terrain. Other areas which should be considered key terrain include--

- Airfields.
- LZs and DZs.
- Fixed or surveyed air defense weapons and radar sites.
- FARPs.

AVENUES OF APPROACH

Airspace avenues of approach are evaluated by the same criteria as ground avenues of approach. A good air avenue of approach permits maneuver while providing terrain masking from air defense weapons systems. Figure C-6 shows an example of an air avenue of approach. Additional variables considered in analyzing the air avenues of approach include the--

- Type of aircraft.
- Maximum service ceiling of the aircraft.
- Attack profile being employed.
- Weapon system or expected ordnance.
- Type of target to be attacked.

The air avenue of approach for an Mi-24 (HIND) with a maximum service ceiling of 12,000 feet and a poor hover capability will differ significantly from that of a MiG-27 (FLOGGER) with a service ceiling of over 60,000 feet, but with a minimum operating altitude of 1,000 feet. Weather aspects (especially temperature, humidity, and cloud cover) also have a significant impact on the ability of aircraft to use a particular avenue of approach. Figures C-7 and C-8 show examples of air avenue of approach cross sections for an Mi-24 (HIND) and an MiG-27 (FLOGGER).

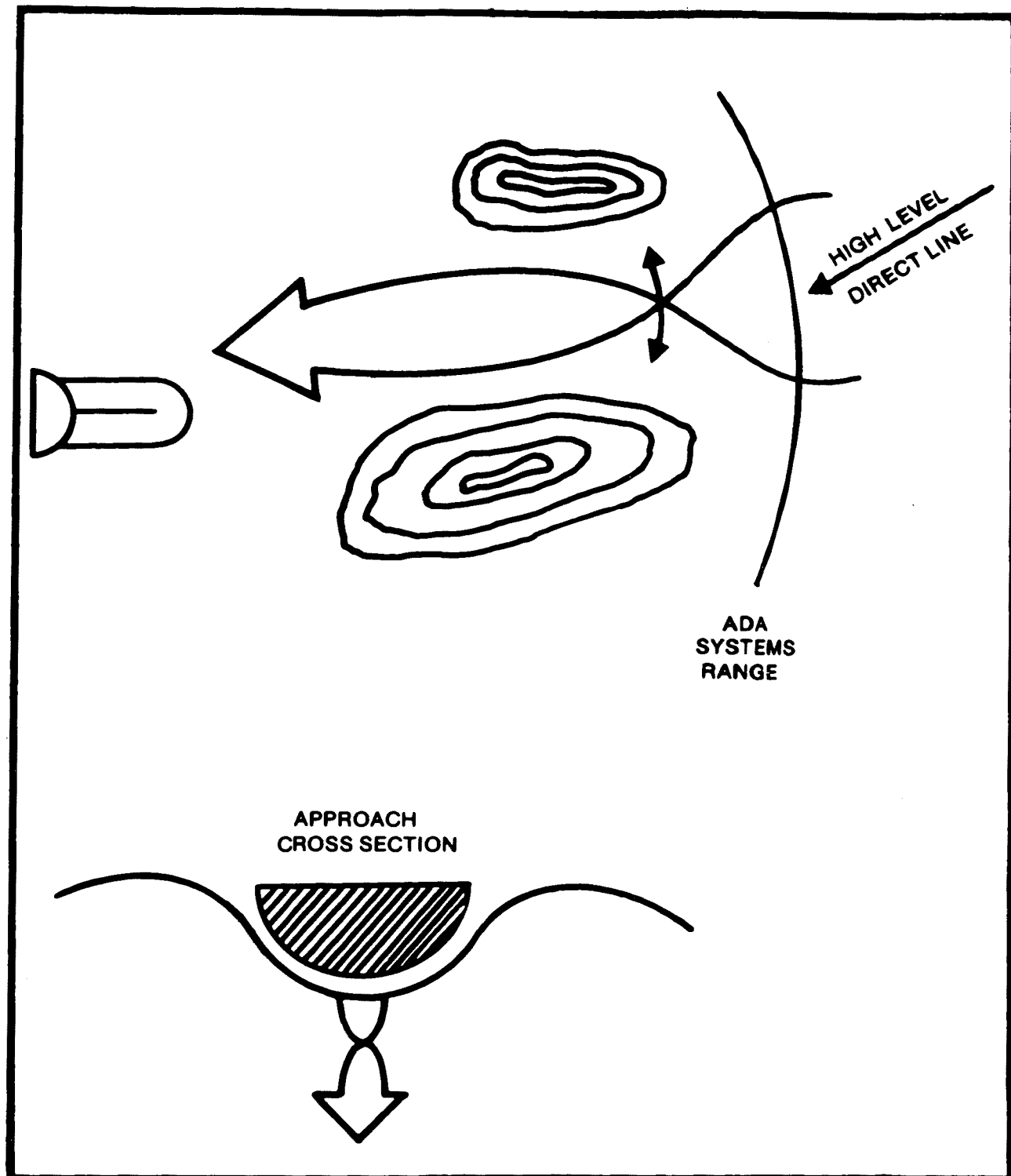


Figure C-6. Example of an air avenue of approach.

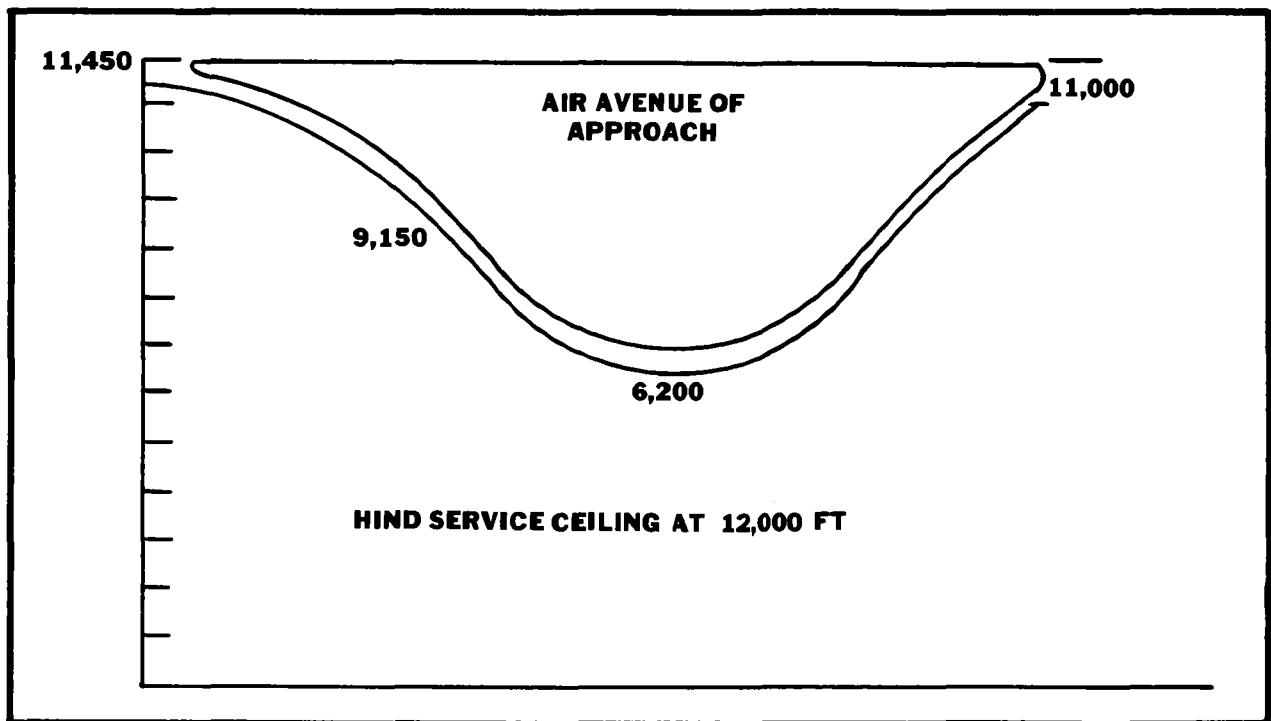


Figure C-7. Example of an air avenue of approach cross section for an MI-24 (HIND).

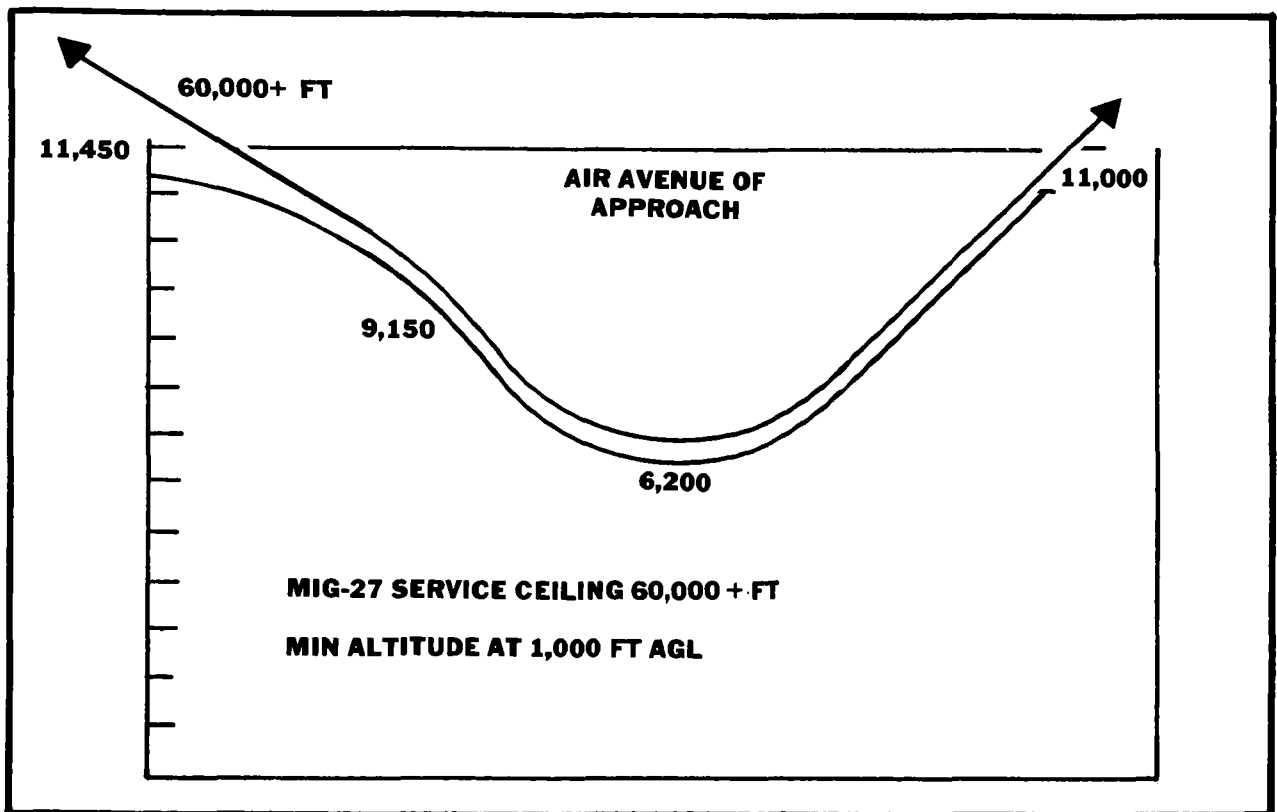


Figure C-8. Example of an air avenue of approach cross section for an MIG-27 (FLOGGER).

WEATHER ANALYSIS

Aviation operations are especially susceptible to the effects of weather. Therefore, intelligence analysts must recognize the significance of weather during airspace analysis. Weather analysis for airspace operations considers the same factors of visibility, wind speed and direction, precipitation, cloud cover and temperature, and humidity as does weather analysis for ground operations.

VISIBILITY

Visibility has a significant impact on aviation operations and visual air defense target acquisition. Visibility usually decreases as cloud cover increases, thereby frequently creating situations which further decrease visibility aloft. CAS operations normally require a minimum cloud ceiling of at least 1,000 feet for rotary-wing aircraft and 2,500 feet for fixed-wing aircraft. Television-guided or infrared precision-guided munitions require cloud-free LOS to the target without falling precipitation or fog.

Factors such as fog, blowing snow or rain, heavy blowing dust, or smoke and obscurants will normally restrict or prohibit operations by aircraft that do not have full instrument flight rules (IFR) capabilities. Even aircraft with such capabilities will normally be unable to conduct low-level approaches, CAS missions, or NOE flights during periods of reduced visibility.

Rotary-wing aircraft are especially restricted during periods of darkness and reduced visibility due to their lack of sophisticated terrain avoidance and target acquisition radars. This is particularly true of threat helicopters which have less sophisticated night vision and infrared target acquisition devices. Most rotary-wing operations become hazardous during times of reduced visibility.

Darkness will not normally place restrictions on radar-assisted or infrared-guided air defense weapons systems. However, periods of reduced visibility will restrict the employment of air defense systems which rely totally on visual target acquisition and tracking.

Reduced visibility in the target area will limit the effectiveness of visual bombing, visual target acquisition, and the accuracy of airborne personnel or material drops.

WIND SPEED AND DIRECTION

The impact of wind on airborne operations can be significant depending on the mission and situation. High winds and associated air turbulence near the ground will normally hinder CAS and aircraft target engagement. Rotary-wing aircraft are particularly prone to severe buffeting by high winds. Under severe wind conditions, rotary-wing aircraft require more time to acquire and engage targets. During engagement, accuracy will suffer, and first-round hit probability will be lower. These effects are most pronounced when wind speeds exceed 17 knots.

Wind speed and direction have an extremely significant impact on airborne chemical delivery operations. Air delivery of chemical sprays or munitions is severely restricted or precluded entirely by high winds. As air-delivered chemical agents are designed to cover as wide an area as possible, their employment under adverse wind conditions significantly increases the likelihood of their being blown over civilian areas or friendly forces.

High winds near the ground may prevent aircraft maneuver, particularly in tight mobility corridors. These corridors often canalize winds, creating excessive air turbulence near the ground. High winds aloft will effect aircraft fuel consumption and payload. Aircraft which encounter severe head winds at operating altitudes will face increased fuel consumption, reduced range, and lowered payloads. Aircraft assisted by high tail winds will receive the benefit of lower fuel consumption and increased range and payloads. High winds and air currents, especially winds and currents associated with thunderstorms aloft, create severe turbulence that can literally tear an aircraft apart. Aircraft with ceilings that do not allow them to climb above such turbulence face severe hazards under such conditions.

High ground winds can cause severe damage to unsecured parked aircraft control surfaces. Exceptionally high winds can destroy or severely damage even well-secured aircraft which are exposed to their direct impact. Figure C-9 shows wind effects on air avenue of approach.

Wind-generated blowing sand, dust, rain, snow, or drizzle can reduce the effectiveness of early warning and aircraft ground controlled-approach (GCA) radars. In some parts of the world, blowing sand creates conditions which severely disrupt both air and ground amplitude modulation (AM) and FM communications. During cold weather, windchill will reduce aircraft sortie generation rates and aircraft refueling or rearming times by forcing ground crew members to work in protective clothing. This also creates a requirement for heated aircraft shelters as major aircraft repairs and maintenance cannot be performed in exposed areas.

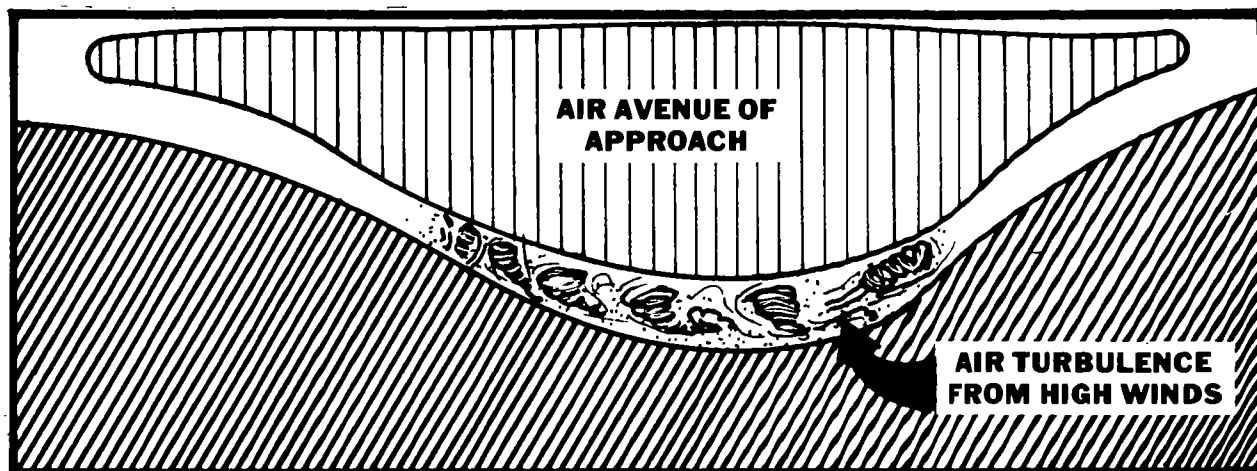


Figure C-9. Wind effects on air avenue of approach.

Wind speed and direction will affect the accuracy of air defense weapons to varying degrees. Wind is also of concern to air defense personnel because of its impact on NBC operations. High winds reduce visibility and together with rain, snow, drizzle, or dust create conditions which reduce the effectiveness of visual air defense target acquisition and tracking. During cold weather, the effects of windchill on air defense personnel and operations are of prime concern.

High winds and associated turbulence will have an adverse effect on the accuracy of airborne and air resupply operations. A ground wind speed of 13 knots is normally considered the maximum allowable to safely drop personnel. High or variable winds aloft will often result in airborne drops being dispersed over too large an area. Turbulence and associated aircraft buffeting will decrease the efficiency of airlifted personnel due to airsickness.

PRECIPITATION

Precipitation often affects aircraft performance, in addition to reducing visibility and the effectiveness of radars. Both rain and snow are often accompanied by icing conditions at aircraft operating altitudes. Icing forces aircraft to operate at lower altitudes, or limits operations to aircraft that have an in-flight de-icing capability. Parked or grounded aircraft must have snow removed and be thoroughly de-iced prior to operations. Rain, snow, and ice on runways will increase the incidence of damage to aircraft on takeoff or landing and will decrease the effectiveness of aircraft braking during landings.

Rain and snow on airfields hinder aircraft refueling, rearming, and maintenance. Sortie generation rates are reduced during periods of heavy rain and snow due to the requirement for greater caution by the refueling and rearming crews, personnel discomfort, and the requirement to move aircraft under cover for even routine maintenance.

Rain and snow will affect cross-country movement by air defense units, and will often make low-lying deployment sites unusable. Extremes of precipitation may restrict off-road access entirely, or swell rivers and streams beyond their banks. This affects both unit mobility and the ability to effectively position air defense assets to support river-crossing operations. Rain and snow will reduce the effectiveness of air defense visual and radar target acquisition and tracking systems and the accuracy of air defense weapons to varying degrees.

Heavy, moist air during rainstorms will affect airborne operations, causing parachutists and air-dropped equipment to remain airborne longer and to descend slower. While heavy air drops can result in fewer personnel injuries and less equipment damage, personnel are exposed to enemy fire for much longer periods.

CLOUD COVER

Cloud cover and ceiling impose severe restrictions on aircraft operations. The existing cloud cover limits or enhances aerial visibility, and concealment restricts CAS and airborne or air resupply operations and establishes the maximum altitude of air avenues of approach for non-all-weather capable aircraft. Aviators avoid thunderstorms and snow clouds because of their potential to generate winds and turbulence beyond aircraft stress limits, hail, and icing conditions. Certain types of cloud cover are associated with violent updrafts and downdrafts which radically affect aircraft altitude and air defense weapon accuracy. Clouds trap heat from the earth and sun raising temperatures near the ground, causing a reduction in aircraft lift rates and rotary-wing hover capabilities.

Heavy cloud cover often canalizes aircraft within air avenues of approach and during the final approach to the target, and may decrease the effectiveness of aircraft camouflage. Knowledge of such canalization will assist the analyst in determining where friendly and enemy air defense weapons and radars should be emplaced. Certain types of clouds, especially clouds associated with thunderstorms, will reduce the effectiveness of air defense radars. Power surges associated with thunderstorms can damage unprotected air defense and aircraft electrical and communications systems. Figure C-10 shows an example of the effects of cloud cover on air avenues of approach.

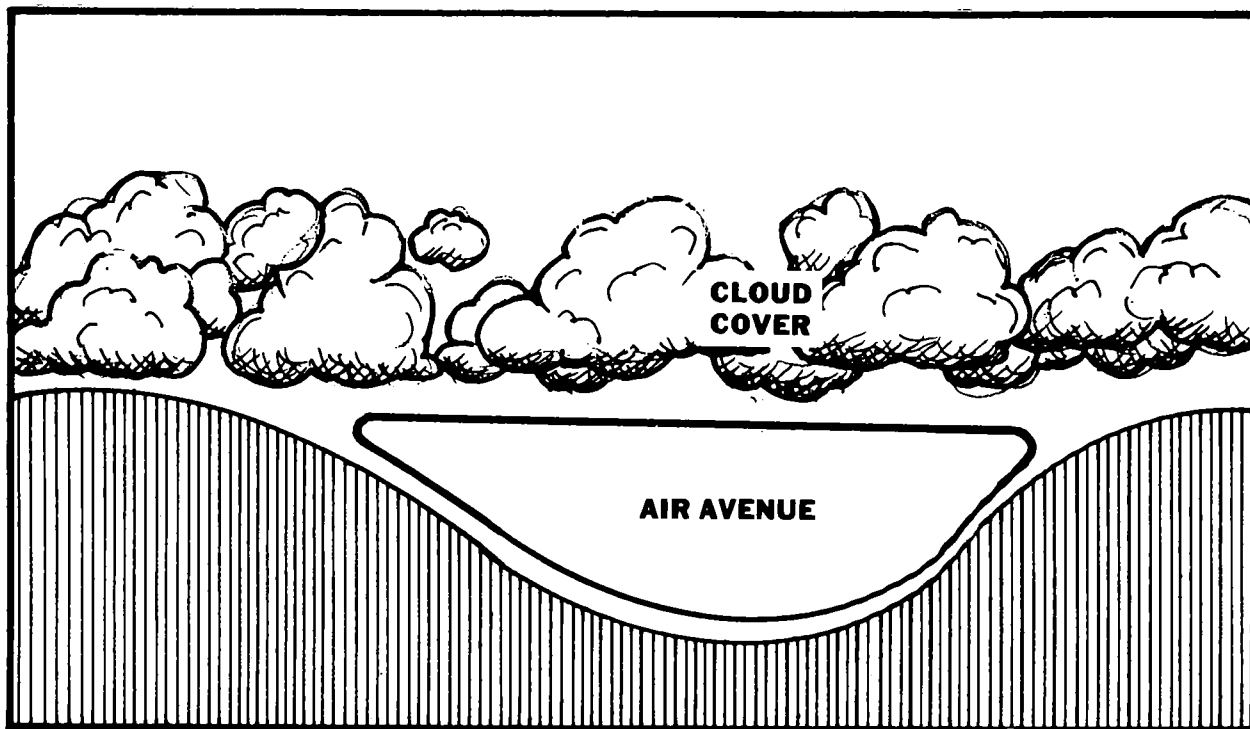


Figure C-10. Example of the effects of cloud cover on an air avenue of approach.

Partial cloud cover (4/8 to 6/8) can create conditions of extreme glare, making visual target acquisition difficult. High performance aircraft will often attempt to use broken clouds and the associated glare to avoid detection prior to entering their attack profile.

TEMPERATURE AND HUMIDITY

Temperature and humidity have a severe effect on aircraft operations when encountered in extremes. Both affect air density, decreasing aircraft propulsion system efficiency, increasing fuel consumption, and ultimately reducing aircraft payloads. These effects are especially pronounced when aircraft are forced to operate from fields over 5,280 feet (1 mile, or 1,608 meters) above sea level.

Temperature and humidity extremes make both aircraft and air defense system maintenance difficult. Extremes increase the potential for temperature-related personnel injuries (heat or cold) and equipment failure (high temperatures and humidity promote corrosion) and may impose special supply or logistics problems (for example, special coolants).

Temperature and humidity affects observation and Foff. High temperatures and humidity in the tropics contribute to the growth of dense vegetation that restricts both air and ground observation and limits air defense Foff. Conversely, the high temperatures and low humidity common in desert areas result in sparse vegetation which permits extensive observation, provides little concealment, and amplifies air defense and aircraft Foff. The sparse vegetation creates the requirement for additional synthetic camouflage for both air defense and aircraft operating in desert terrain. High desert temperatures decrease aircraft lift potential and increase aircraft and air defense system maintenance requirements. In certain cases, desert conditions could mandate special aircraft or air defense operating schedules, reducing the available support or air defense coverage. Desert operations also mandate special aircraft lubrication oils and filters.

THREAT EVALUATION

The threat evaluation phase of airspace analysis consists of a detailed study of enemy aircraft; cruise missile systems; air-to-surface missiles; long-range missiles; air defense weapons systems; and airborne, air assault, and small-unit air insertion aircraft and techniques. It includes a detailed examination of enemy air forces, air defense units, airborne and air assault units, and SPETSNAZ force organization.

The capability of these elements to operate within the battlefield environment is thoroughly evaluated. In the case of threat aircraft, air defense, and cruise missile systems, the evaluation includes an assessment of enemy capabilities relative to friendly systems.

The following represent some of the areas that must be examined when evaluating enemy aircraft performance:

- Organization of threat fixed-wing and rotary-wing aviation units (air OB).
- Capabilities of fixed- and rotary-wing aircraft in terms of--
 - Performance (speed, ceilings, airfield restrictions).
 - Ordnance load (maximum weight and types).
 - Navigation capability.
 - Weapons delivery systems.
 - Combat radius.

- Ordnance performance characteristics that include range, release altitudes, ordnance release lines, warhead types, and guidance nodes, such as--

- Guns.
- Rockets.
- Tactical air-to-surface missiles (TASM).
- Cluster bomb units (CBUs).
- Precision-guided munitions (PGM).

- Tactical flight doctrine, to include--

- Raid sizes or composition.
- Entry or exit altitudes and speeds.
- Ordnance delivery profiles.
- Use of ECM or infrared countermeasures.

- Priorities for air attack.

- C² procedures, to include--

- Ground control system.
- Air control system.
- Air strike allocation procedures.
- C³ nodes.

- Maintenance and sortie generation capability.

Figures C-11 through C-19 show USSR and US combat and support helicopters, comparable tactical aircraft, military transport aircraft, tactical SAMs, and long-range cruise missiles.

Threat evaluation also includes an examination of both friendly and enemy HVTs and critical nodes. This is often difficult because aircraft, air support and logistics facilities (airfields and depots), air defense nodes and air LZs and airborne DZs are by their nature HVTs or HPTs to both enemy and friendly forces. The analyst must therefore guard against including everything in the category of HVTs by selecting only those targets which have an immediate impact on operations.

Doctrinal movement rates for aircraft do not exist. The analyst therefore evaluates aircraft movement in terms of maximum effective

range, at optimum speed (not maximum speed), with an optimal weapons load and for a specific attack profile. Air transport operations are normally evaluated in terms of maximum range, at best cruising speed with the highest possible payload. Doctrinal movement rates for air defense units are computed exactly like those for other ground force units.

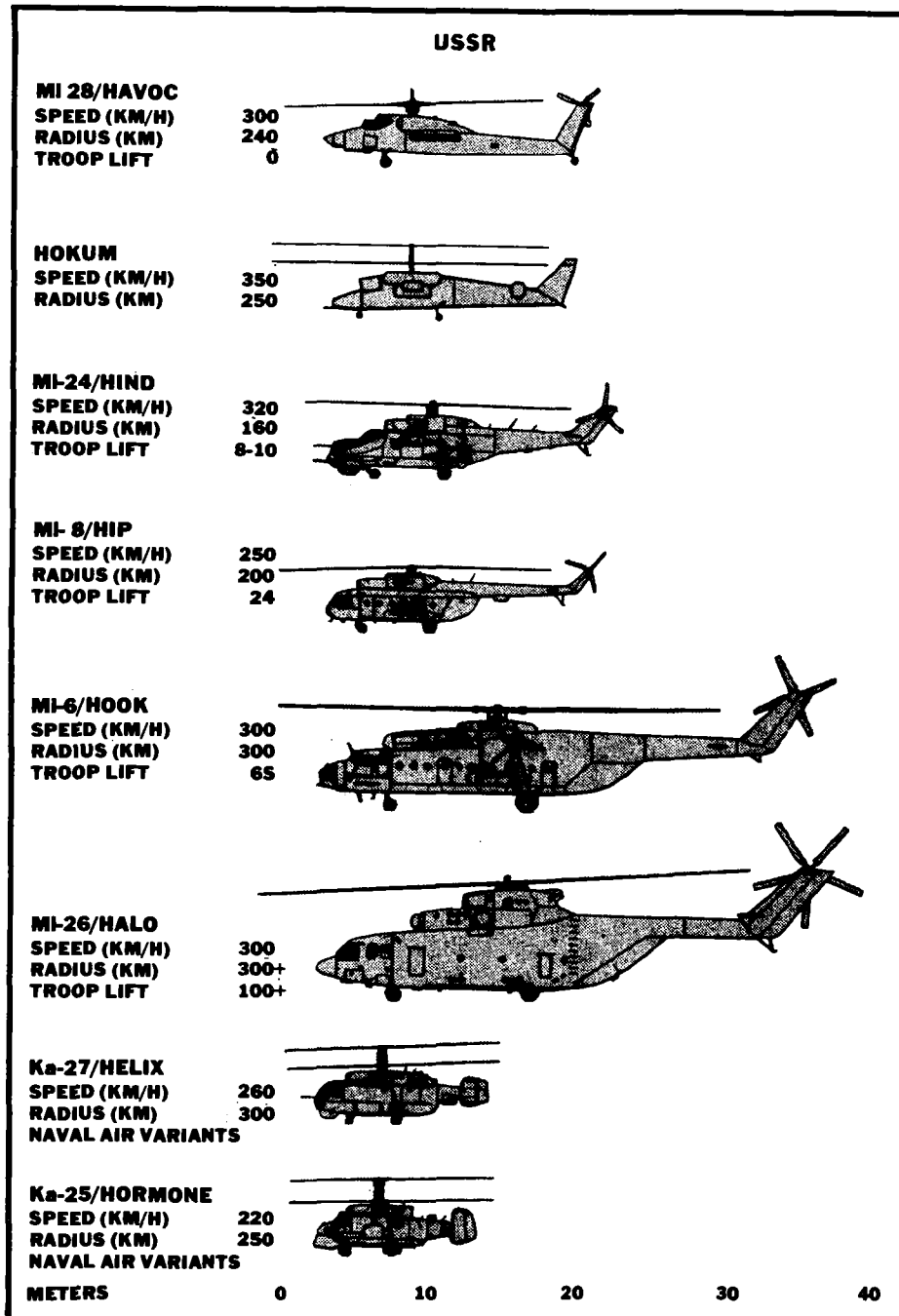


Figure C-11. USSR combat and support helicopters.

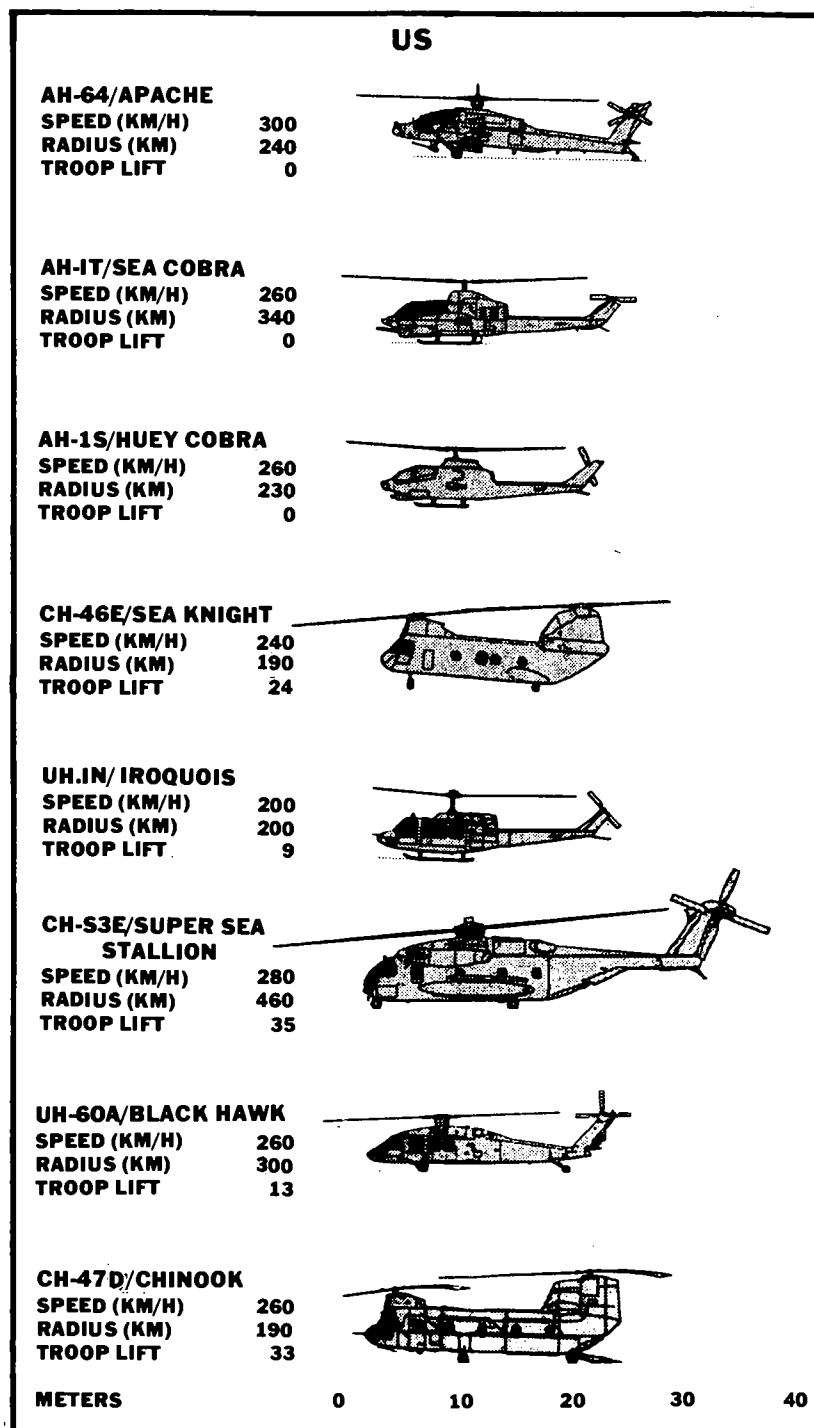
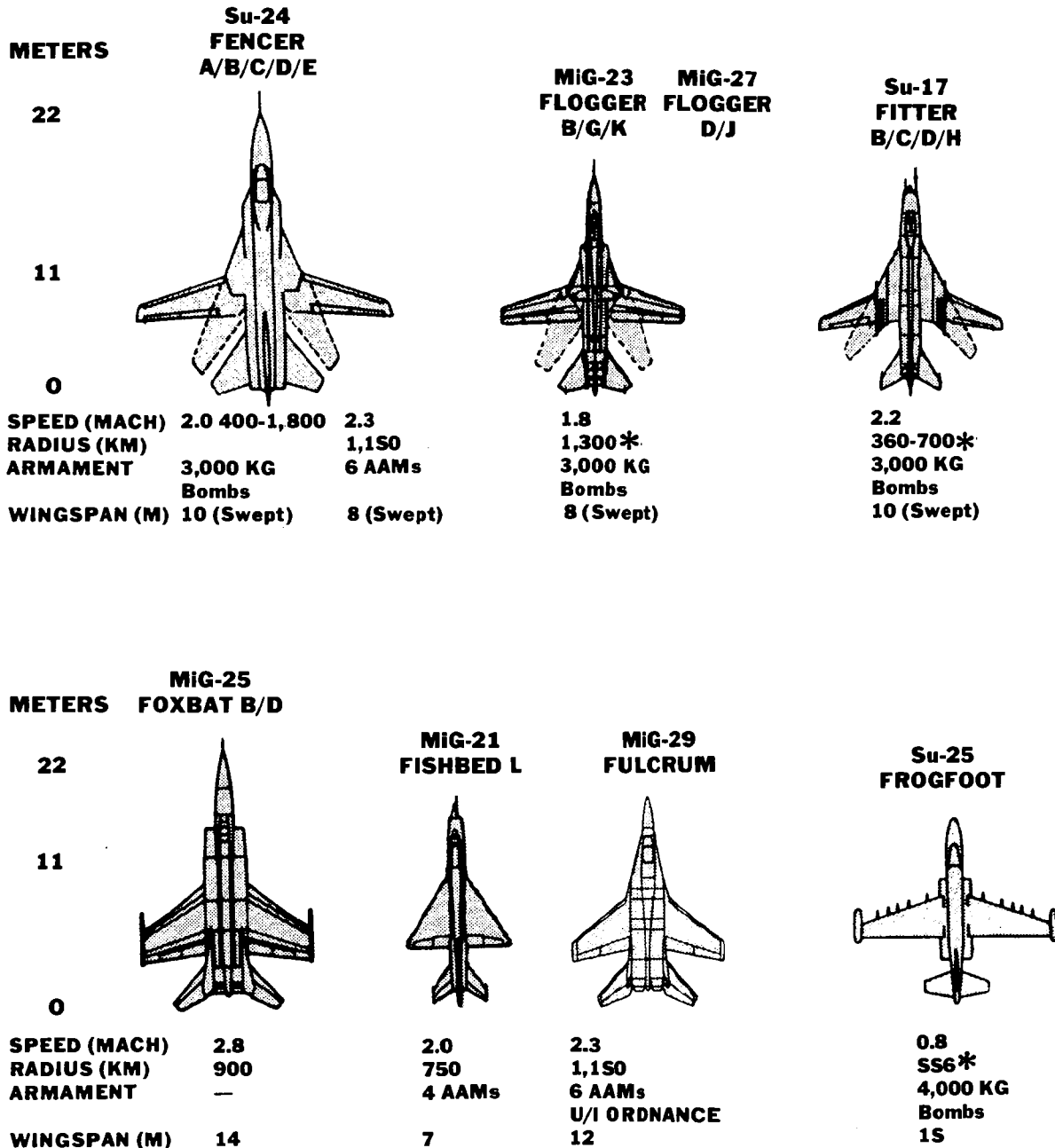


Figure C-12. US combat and support helicopters.

USSR



*Includes all known variants, profiles and ordnance combinations.

Figure C-13. USSR comparable tactical aircraft.

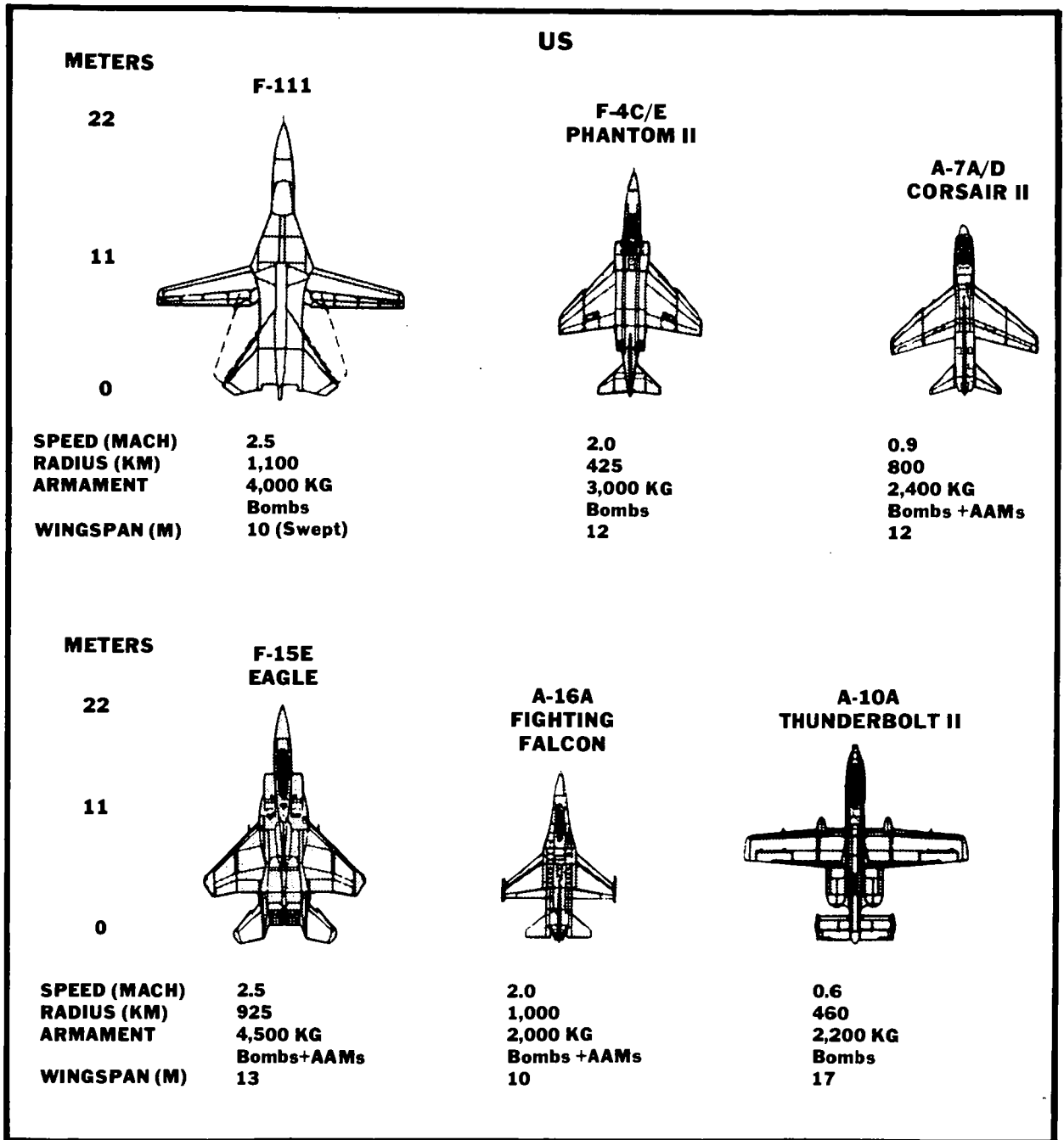


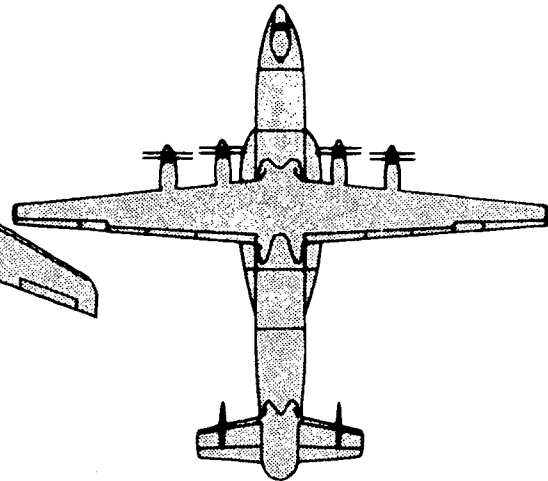
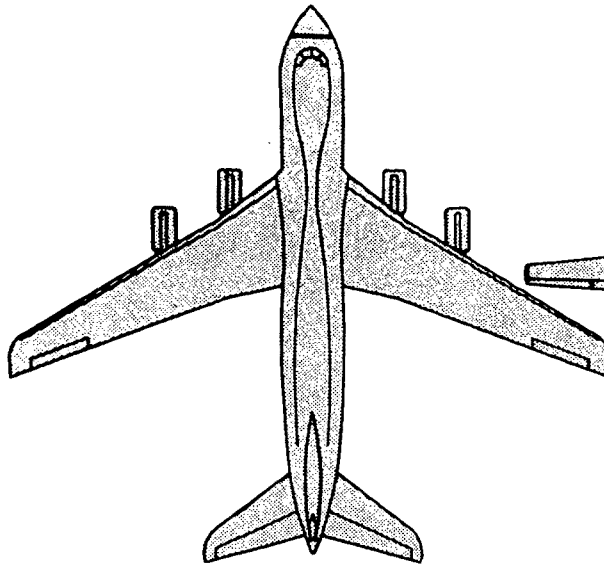
Figure C-14. US comparable tactical aircraft.

METERS
75
60
45
30
15
0

USSR Military Transport Aircraft

AN-124/CONDOR

AN-22/COCK



MAX PAYLOAD (MT) 150
TROOP/PARATROOP CAPACITY 415/320
UNFUELED COMBAT RADIUS 3,400

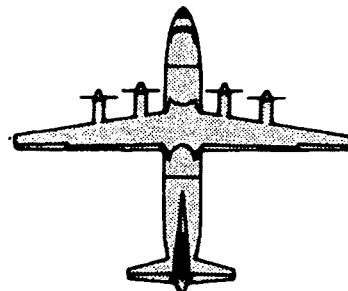
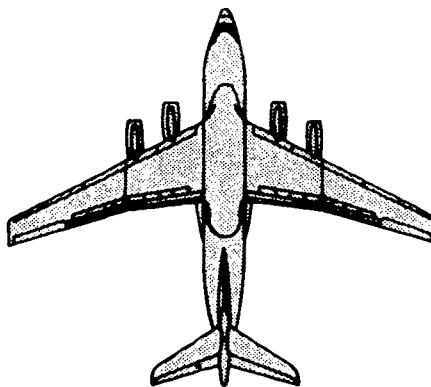
80
175/175
2,500

SS Military Transport Aircraft

METERS
75
60
45
30
15
0

II-76/CANDID

AN-12/CUB



MAX PAYLOAD (MT) 40
TROOP/PARATROOP CAPACITY 150/140
UNFUELED COMBAT RADIUS 3,350

20
90/60
1,500 **Air refuelable**

Figure C-15. USSR military transport aircraft.

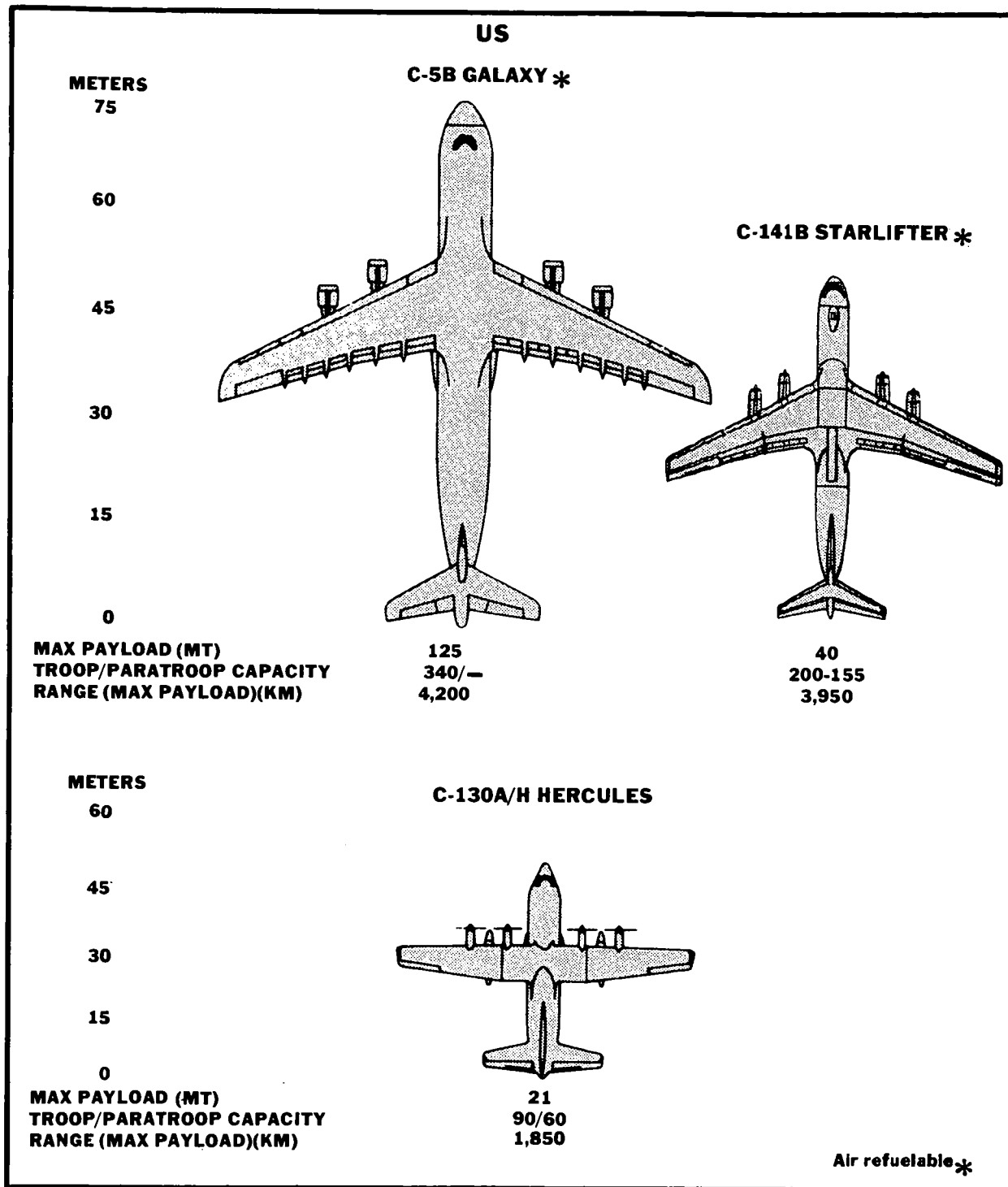


Figure C-16. US military transport aircraft.

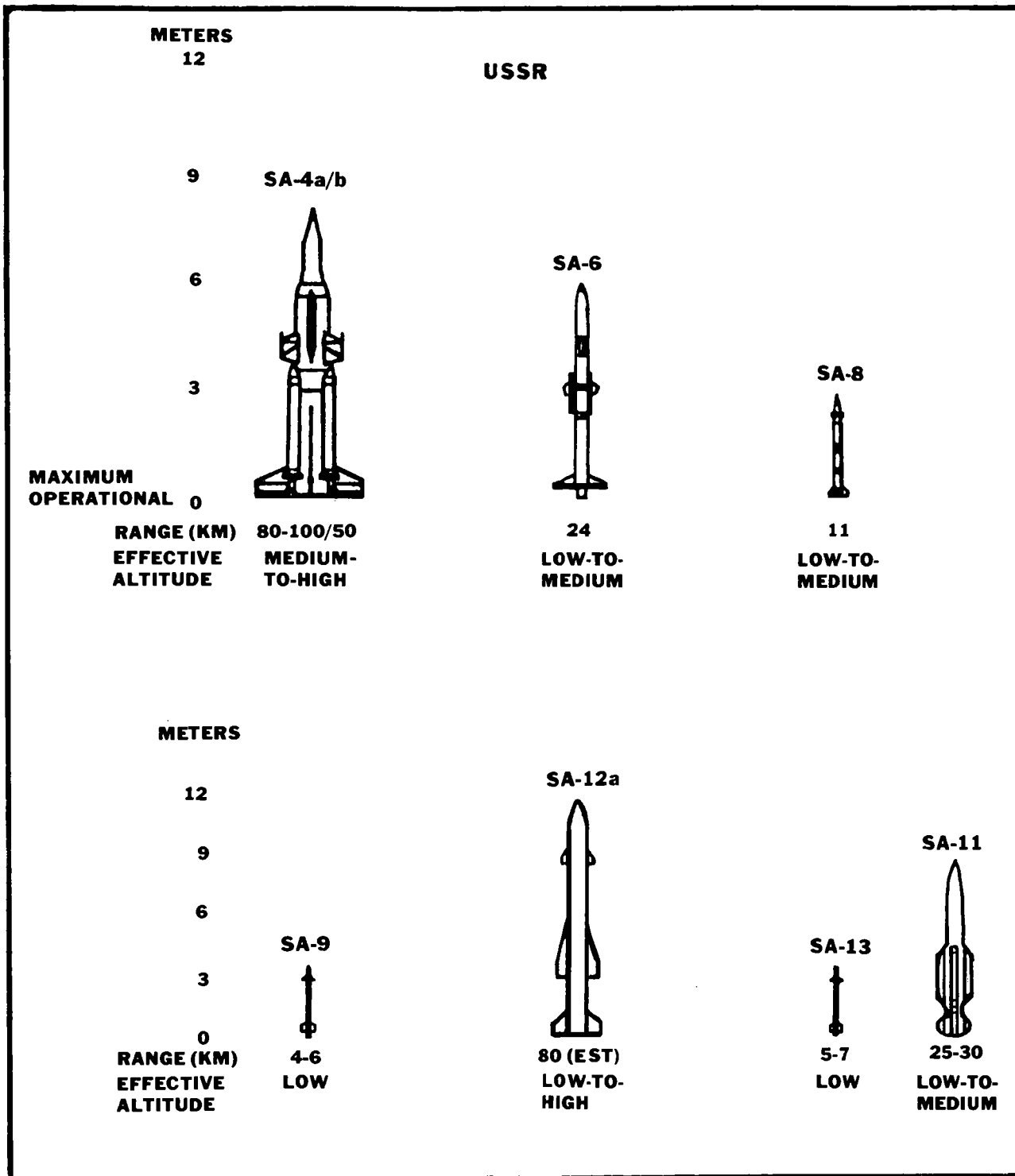


Figure C-17. USSR comparable tactical SAMs.

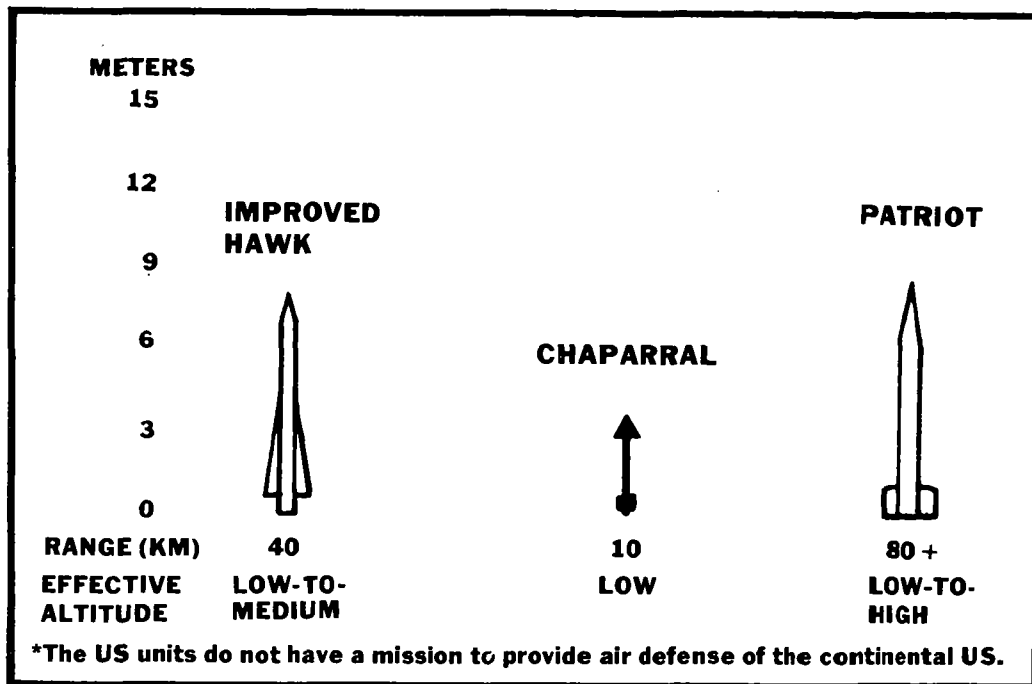


Figure C-18. US comparable tactical SAMs.

Doctrinal templates for most airspace operations are not prepared. If time permits, templates showing the most direct air routes into an objective may be prepared with the understanding that considerable deviation is possible. Instead, the analyst should concentrate on the doctrinal attack profiles employed by threat aircraft types. Figure C-20 shows an example of aircraft attack profiles.

Doctrinal templates for air defense units and elements are developed in the same manner as for other ground force elements. Doctrinal templating may be general, depicting unit locations, or specific enough to depict individual radars, launchers, or weapons. Figure C-21 shows an example of a doctrinal template for air defense deployment of an MRD area in the attack.

Doctrinal templates are prepared of airborne and air assault operations of company size or larger. These templates are developed using the following considerations:

- ° Surprise and speed are the principal advantages during airborne and air assault operations.

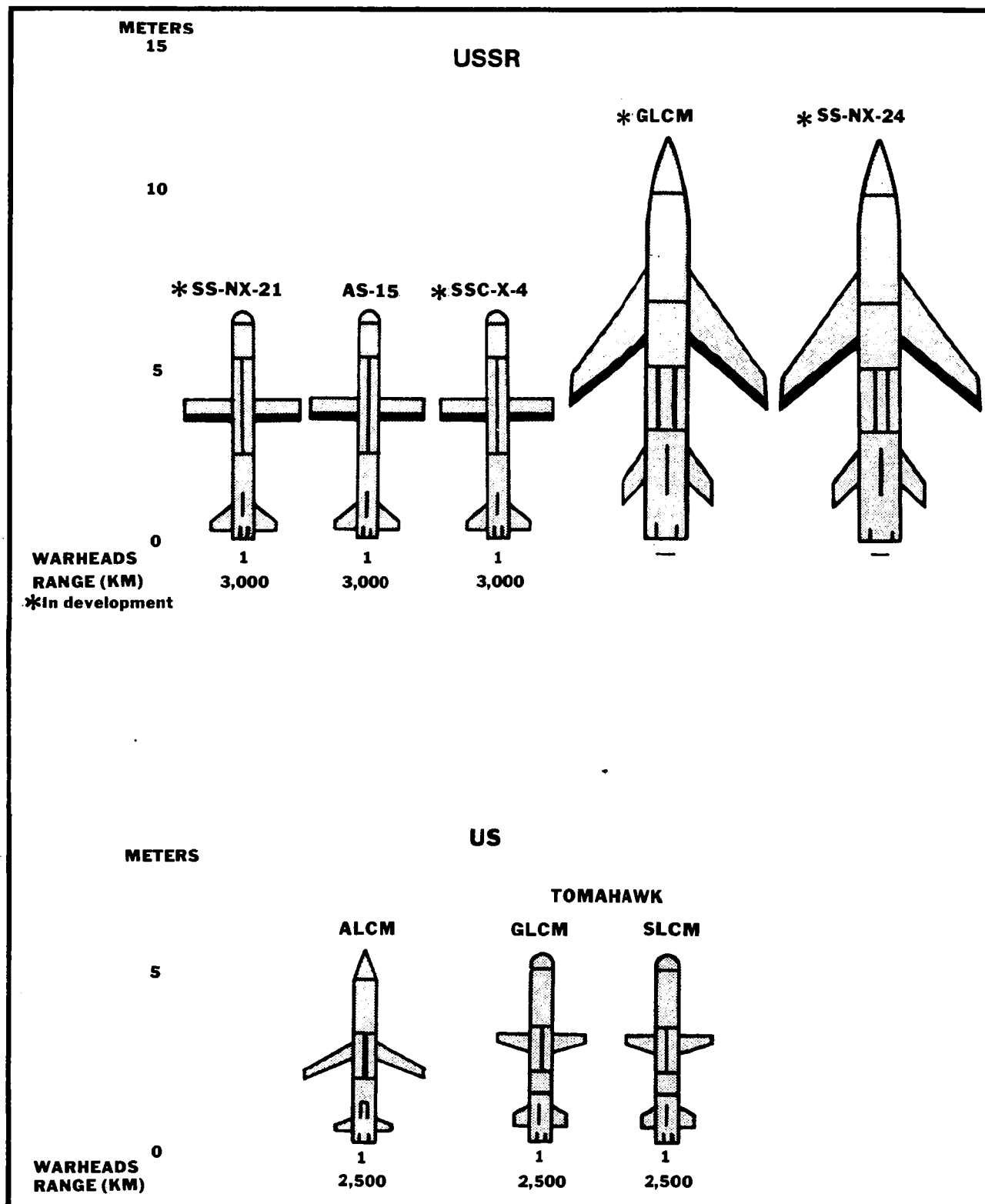


Figure C-19. USSR and US long range cruise missiles.

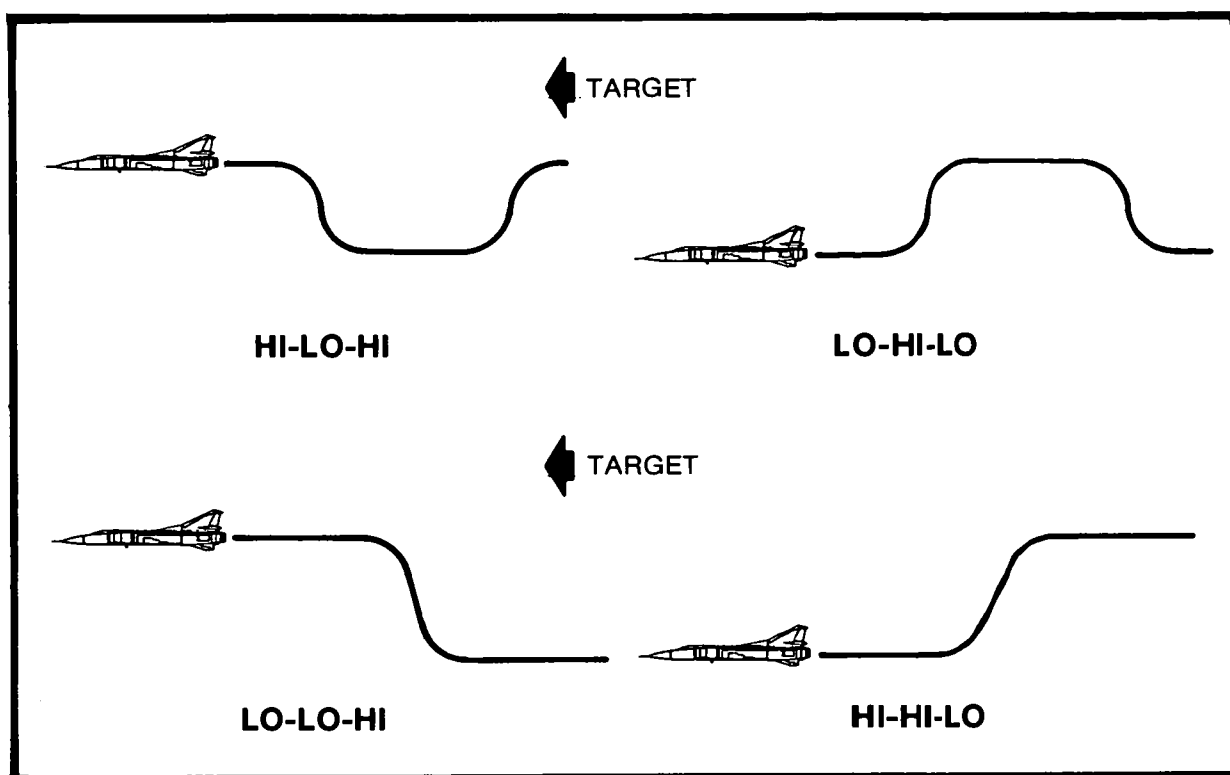


Figure C-20. Example of common fixed-wing aircraft attack profiles.

- Extensive security measures are employed to screen the location of the LZ and DZ and the approach of the force.
- Landings will be in undefended areas, or in areas where the defenses have been neutralized.
- There must be effective air cover, and air defenses must be suppressed along the entire flight approach route.
- LZs and DZs will be located as close to the objective as security permits.
- When circumstances permit, particularly for assaults in support of water crossings, the LZ and DZ will be on the objective.

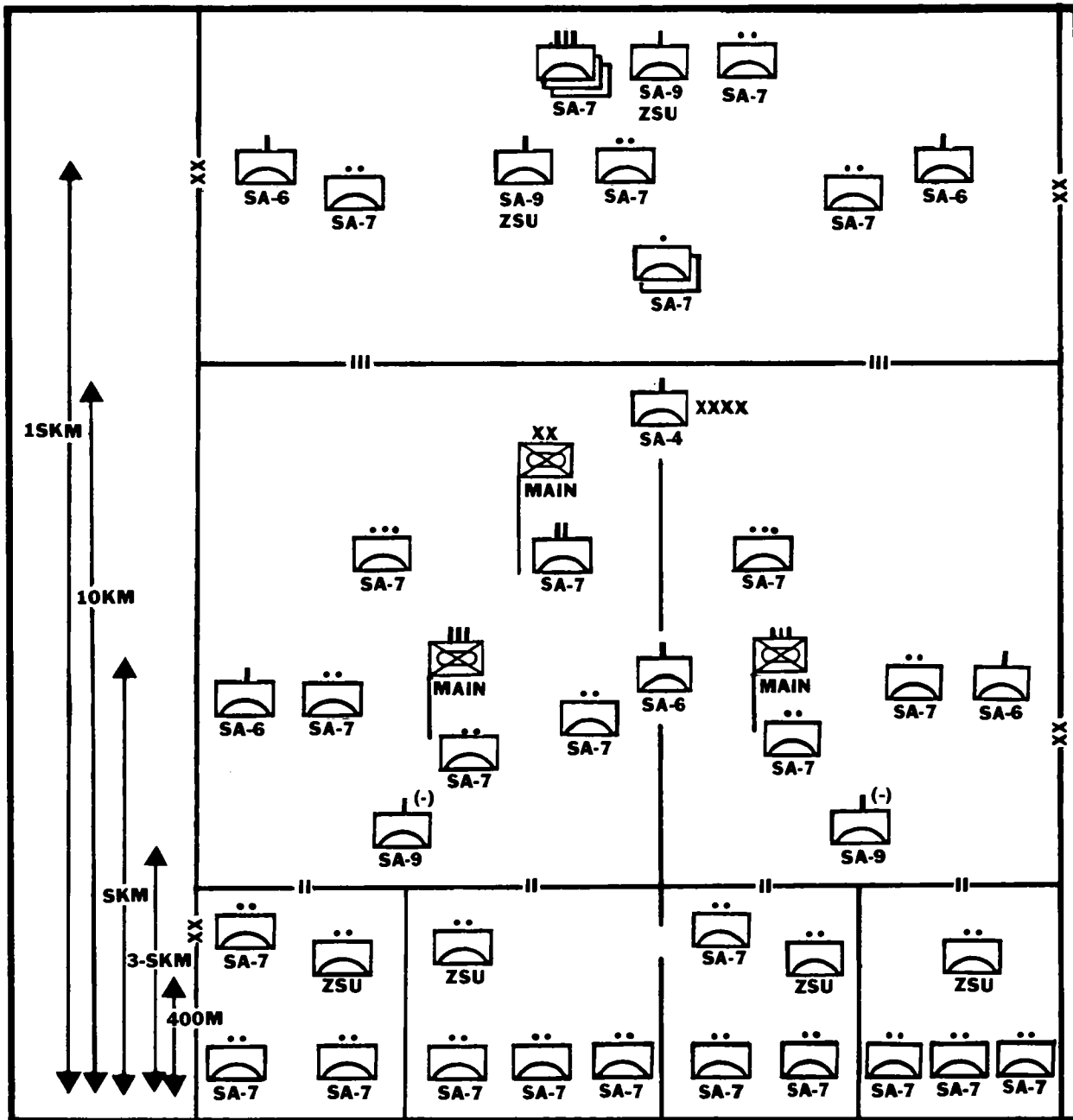


Figure C-21. Example of a doctrinal air defense deployment MRD area in the attack.

- Doctrinal size of an LZ and DZ is approximately 3 by 4 kilometers. An airborne regiment will normally be allocated one or two of these zones for operations. Air assault battalions are normally allocated only one LZ per operation.
- Airborne operations can be conducted out to the maximum range of air strikes, missile strikes, and the artillery of advancing ground forces.
- Air assault operations are normally limited to 50 kilometers beyond the FEBA.
- Air assault operations are critical in support of river crossings, to seize advantageous terrain as a forward detachment of advancing forces during pursuit and mountain operations.
- During air assault operations, helicopters will fly as low as 50 meters and will use terrain to mask their approach.

Figures C-22 and C-23 show examples of doctrinal templates for an air assault operation and airborne operation.

Once the airborne or air assault forces are on the LZ and DZ, doctrinal template development is similar to that accomplished for light infantry operations. This development must consider that doctrine calls for a 1-hour consolidation period on the LZ or DZ prior to beginning movement to the objective. Templating must also consider that although some heavy equipment may be landed or dropped with the forces, units will still lack tank, long-range artillery, heavy engineer, and heavy AT support.

Airborne and air assault operations are not conducted without supporting forces attempting to move towards the same objective. Without relief, airborne forces are soon overwhelmed and destroyed. It is, therefore, necessary to relieve these forces with regular units as soon as possible.

THREAT INTEGRATION

Like IPB for other areas and battlefield functions, airspace analysis relates the enemy's air, air defense, counterair, and airborne or air assault doctrine to the effects of the weather and terrain to help determine how the enemy will employ the enemy's air-associated assets. It also helps determine how the weather, terrain, and enemy air and air defense forces can effect friendly air-associated operations. As with other battlefield functions, airspace threat integration is accomplished through the development of situation, event, and decision support templates.

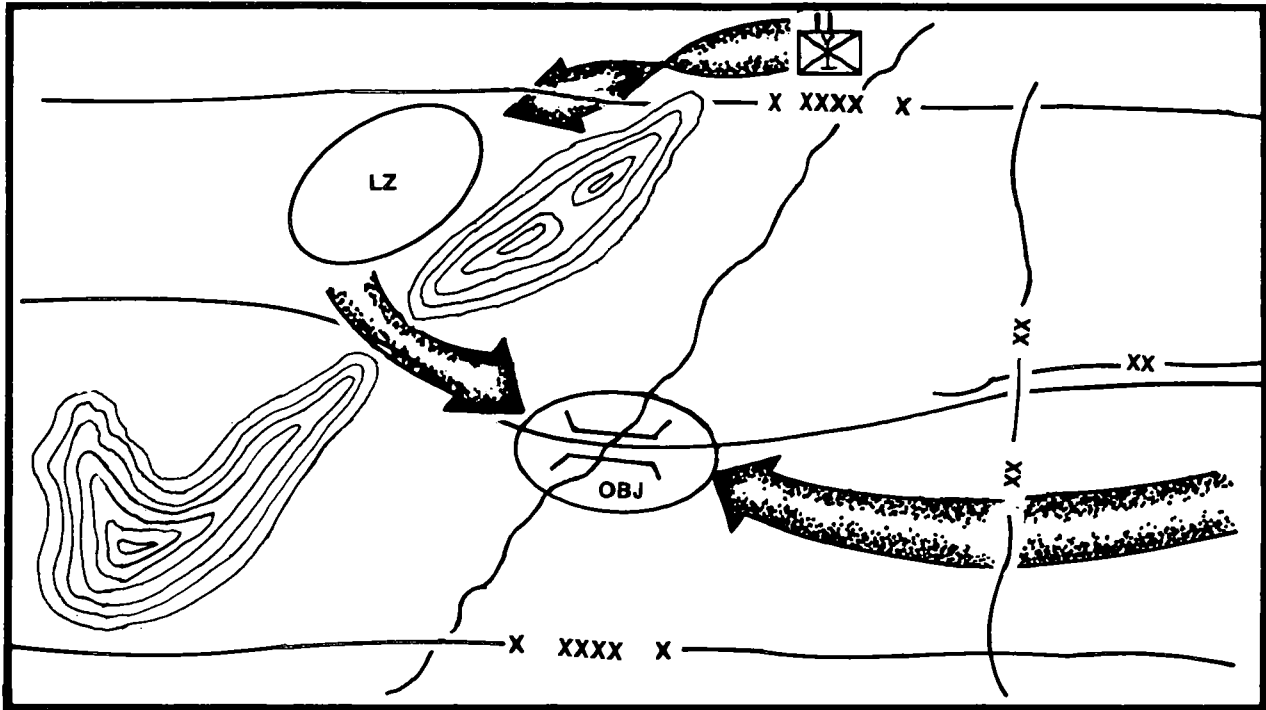


Figure C-22. Doctrinal template for an air assault operation.

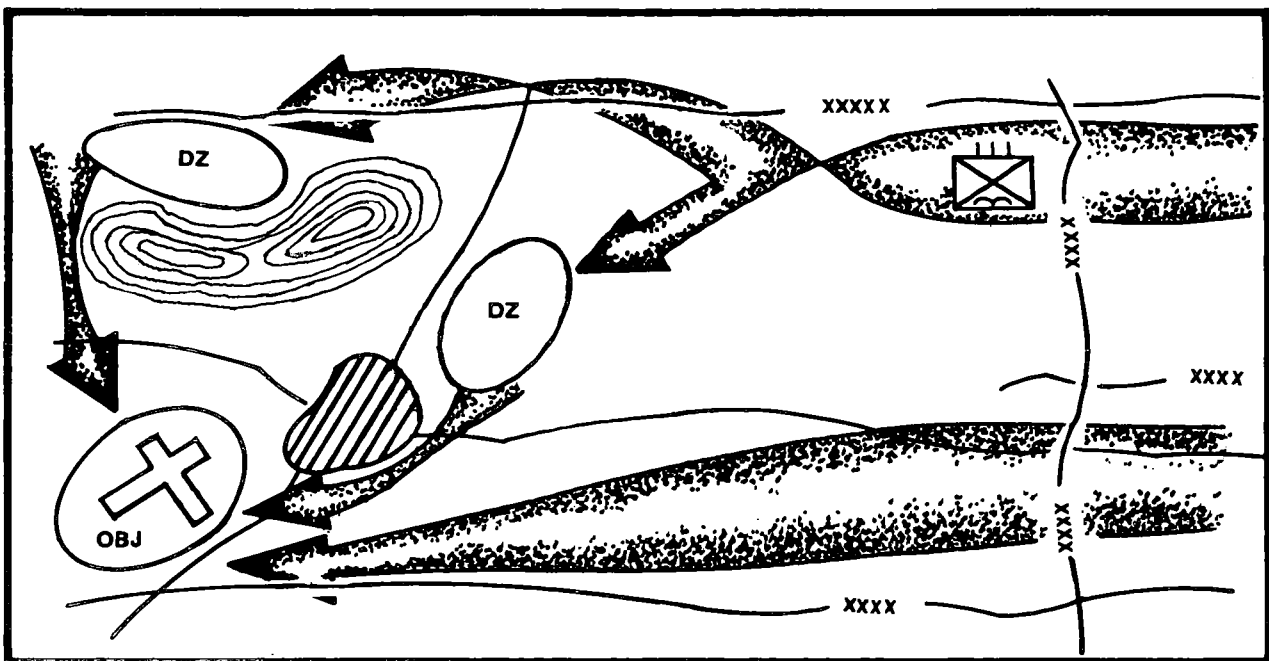


Figure C-23. Doctrinal template for an airborne operation.

Although doctrinal templates are not prepared for most air-associated operations, it is relatively easy to develop situation templates which integrate aircraft attack profiles with terrain constraints. The integration process focuses on specific air avenues of approach and mobility corridors to determine which are most capable of supporting specific attack techniques and profiles.

Situation templates for air defense operations are basically ground force templates and are developed in the same way as other ground force templates. In addition to the effects of terrain conditions on mobility and doctrinal dispositions, they focus on specific air avenues of approach and mobility corridors and determine where aircraft can best use the terrain to mask air defense target acquisition radars and weapons (oblique LOS). Situation templates for both friendly and enemy air defense operations are developed in the same manner. Situation templates show ranges, overlapping coverage areas, and masked areas for all air defense weapons systems. Notes in template legends should list the maximum and minimum effective altitudes of the weapons. Figure C-24 is an example of an air defense situation template.

Situation templates for the air phase of airborne and air assault operations focus on the most direct routes to the LZ and DZ. These routes must provide the approaching airborne force with security and at least some concealment and cover. Templates for the ground phase are prepared based on the ground employment doctrine for airborne forces. Situation templates are not prepared for small air insertions such as SPETSNAZ operations.

Attack profiles play a key role in situation templating, as all airspace analysis is basically situational in nature. Employment of a certain attack profile will depend on the avenue of approach, the terrain, the enemy air defense posture and capabilities, the fuel and ordnance loads required, the distance to the target, and the aircraft mission. Figure C-25 is an example of an air threat (rotary-wing).

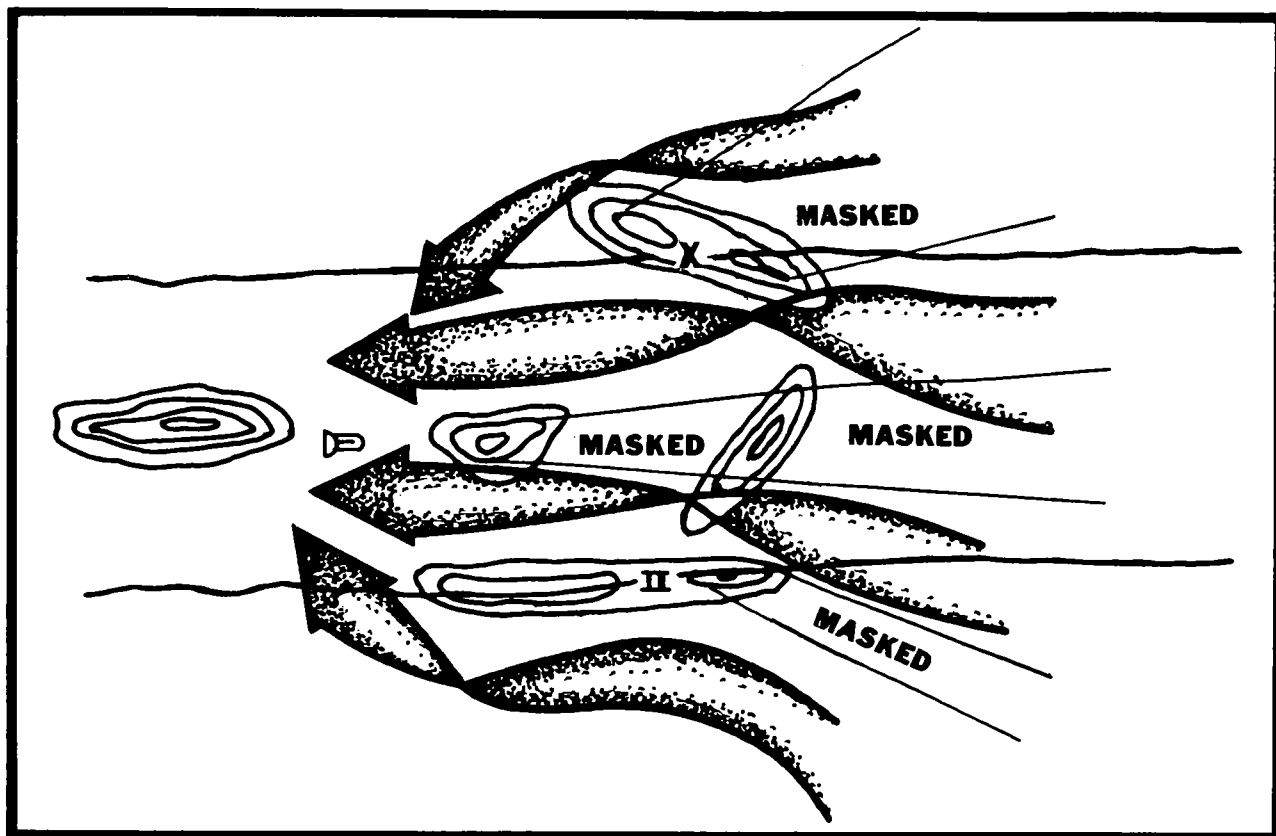


Figure C-24. Example of an air defense situation template.

Event templates for air-associated operation areas are based on situation templates. Event templates for air defense operations are developed like other event templates. However, the NAIs are based on the terrain constraints on aircraft approach routes to potential targets, and an analysis of the enemy's attack profiles. In areas where few terrain constraints exist, route and area NAIs are extensively employed to help determine the best locations for long-range surveillance and target acquisition radars.

NAI placement for other air-associated operations is based on terrain masking of radars and weapons terrain, the most direct route to the potential target, the degree of operational security required, and the requirement for early acquisition of the target by the aircraft. Event templates for deployed airborne and air assault forces are prepared in the same manner as for other ground operations. Figure C-26 is an example of an air event template.

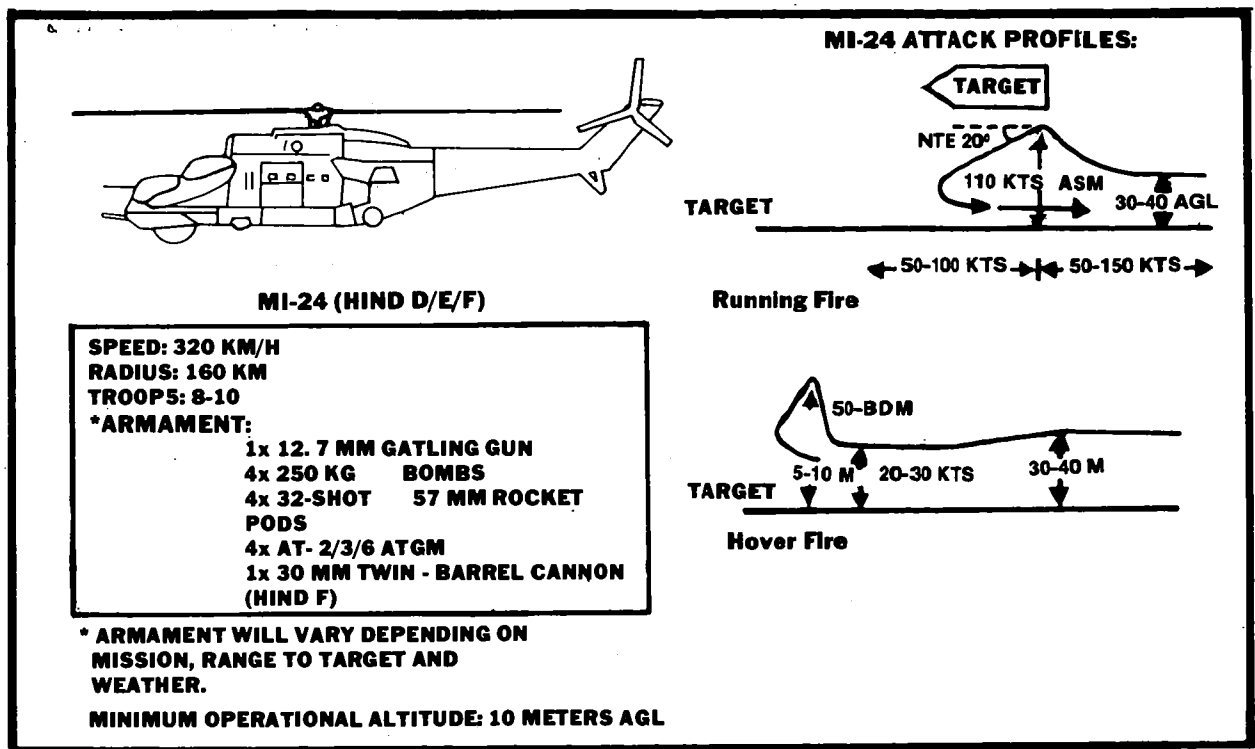


Figure C-25. Air threat (rotary-wing).

DSTs for air-associated operations are based on event templates. Separate DSTs are normally constructed for friendly air defense and airborne or air assault operations. Separate DSTs may also be constructed for friendly CAS and battlefield air interdiction operations if the time and situation permit. All air-associated DSTs should show the air avenues of approach and mobility corridors, the ranges of friendly and enemy air defense systems, TAIs, and DPs. Due to its transitory nature, the current air situation is not shown. However, the number of available sorties is shown for friendly operations.

TAIs and DPs are determined in much the same way as for ground operations; however, due to high aircraft speeds, they must be placed significantly farther in advance of the TAIs. When employing friendly aviation assets, these DPs must be placed far enough in advance of the target to allow sufficient time for the aircraft to be placed on strip alert and to arrive on target, and for associated jamming and fire support programs to be placed into effect. When supporting air defense operations, they must be placed to confirm the enemy plan of attack and to allow sufficient target acquisition and firing time. When determining the

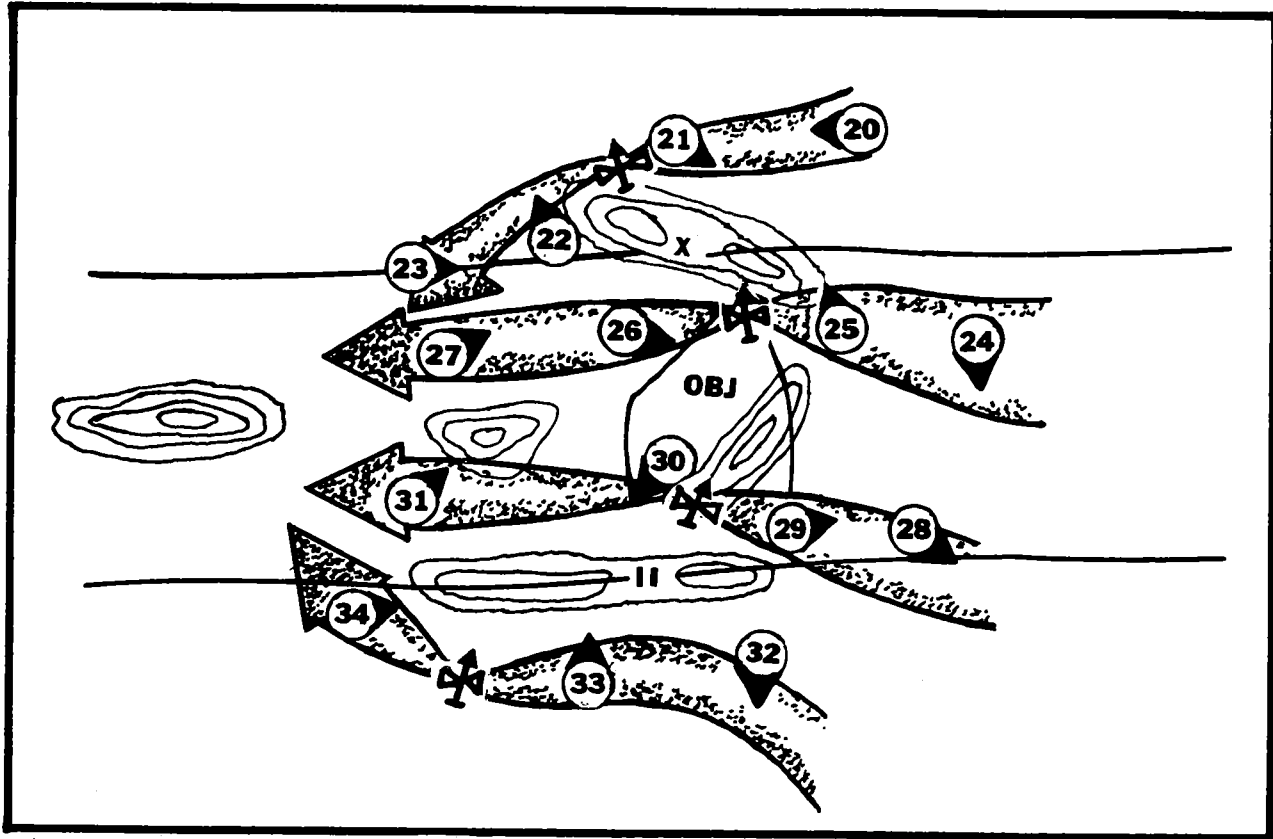


Figure C-26. Air event template.

effects of the enemy's air defense effort, DPs are placed where enemy commanders would most likely be forced by weather, terrain, and friendly aircraft corridors and profiles to decide to employ their air defense assets to their greatest benefit.

The friendly air defense DST is a joint effort of the G3 or S3, G2 or S2, and the air defense officer (DAME or CAME at division and corps). The friendly air employment DST is a joint effort of the G3 or S3, G2 or S2, FS0, and the combat aviation brigade commander or air liaison officer.

APPENDIX D

OPERATIONAL LEVEL OF WAR

The hub of the structure of modern warfare is operational art, the second major component of military activity, and the highest with which AirLand Battle Doctrine is concerned.

OPERATIONAL ART

Operational art involves the orchestration of military power in a theater to achieve national military objectives as part of a coordinated national strategy, and the tactical application of combat, combat service, and CSS assets to achieve national military objectives. Fundamentally, it is the sequencing of tactical activities and events as part of an overall campaign plan to create the desired military conditions for accomplishment of a political objective. The operational commander, given the desired political outcome, determines the military objectives and tactical assets necessary for its accomplishment.

The establishment of unified commands to support peacetime planning in theaters of war is a post-World War II phenomenon which grew out of the lessons learned prior to and during the conduct of war. Contingency or peacetime planning in theaters of war and subordinate theaters of military operation is intended to reduce those analyses and actions that a theater Commander in Chief (CINC) and staff would be required to undertake in the event of war.

In peacetime, theater staffs plan for the initial campaign which will be fought once international borders have been breached; upon the initiation of hostilities, theater planning focuses on subsequent campaigns to be fought. Determination of the probable courses of threat action in a theater of operations is similar to the process which tactical-level organizations use to answer the concerns of the division or corps commander: Who, what, when, where, and in what strength. While planning considerations at the tactical level of war will be principally military in nature, planning considerations at the operational level of war will incorporate political, economic, psychological, sociological, military, and geographical factors on an international scale.

Just as the tactical commander will strive to understand more fully the background, peculiarities, and characteristics of a new mission, so too will the operational level commander. This commander must fully grasp the interests of US policymakers in a given geographical region, politically imposed constraints on the application of military force, and the national will to support the presence of US military forces, and to support combined military operations. For instance, considerations might include readiness actions to be authorized by the National Command Authority (NCA); which independent nations in the theater will grant over-flight and landing rights; rules of engagement; impact of neutral parties on the scope of military operations; and the employment of nuclear weapons. The same intellectual process (IPB) which reduces uncertainty

for the tactical commander can be adapted to do the same for the operational level commander.

A definition of operational level of war intelligence requirements is a prerequisite to developing an operational level intelligence perspective and determining the steps or functions of IPB at the operational level of war. The intelligence requirements of the NCA are global and may conflict with the stated intelligence requirements of a theater CINC.

While a theater commander may require access to strategic intelligence assets to support peacetime or wartime campaign planning, the immediate orientation of the NCA may be towards political and military developments in another theater of war. Scarce national level or strategic systems will be allocated to satisfy the intelligence requirements of the NCA and the unified and specified commands. The five unified commands with distinct geographic responsibility are--

- United States European Command (USEUCOM).
- United States Atlantic Command (LANTCOM).
- Pacific Command (PACOM).
- Central Command (CENTCOM).
- United States Southern Command (USSOUTHCOM).

The commands must carry out peacetime responsibilities within the political, economic, military, and psychological parameters defined by the NCA through the Joint Strategic Capabilities Plan (JSCP).

The military strategy, force structure, and intelligence requirements of each theater are distinct. The nature of alliances, enemy military capabilities, and political and military objectives in theater, geographical factors, and popular support for US strategic objectives are different within each theater of war. Neither strategic nor tactical level organizations have the necessary resources or are sufficiently sensitized to satisfy these operational-specific requirements.

A comprehensive analysis of the nature of a theater of war is a prerequisite to the development of theater strategy and associated campaign planning. The theater commander and staff must discern and balance the five elements of power (political, economic, geographic, military, and national) that will not only defeat the enemy's center of gravity but also protect the friendly sources of strength. This discernment is the essence of operational art, and the role of intelligence is key.

It is not enough to state that the intelligence requirements of the operational level commander will be satisfied because of the fusion of tactical and strategic intelligence. The assets of the strategic intelligence community are overextended in peacetime and may be

overwhelmed in wartime if the goals (aims) of collection in support of strategic and operational decisionmaking are not defined. The tactical intelligence perspective is narrow; rightly focusing on evolving battles and engagements and the rapid dissemination and exploitation of combat information and tactical intelligence. In fact, intelligence produced at the tactical level of war, if not carefully screened, could overwhelm theater Army group and field Army intelligence staffs and distract them from their operational perspective.

A definition of operational level of war intelligence must consider the decisionmaker to be supported and the purpose for employing joint and combined forces at the operational level of war. However, the echelon focus at the operational level depends on the situation and nature of the theater of war, the political and military objectives of the combatants, and the types of military forces which can or may be employed. Hence, no single echelon of command has exclusive responsibility for operational art. For example, during World War II, campaigns and major operations were designed by theaters and Army groups, respectively, while field armies, corps, and divisions fought battles and engagements. During the Vietnam War, though, given a theater campaign plan designed by Military Assistance Command-Vietnam (MAC-V) headquarters, major operations were designed by corps headquarters.

While the corps is the Army's largest tactical unit, it can be employed as the land component of a joint task force (JTF). The armed force of a JTF may also be a division or separate brigade. When so employed, the corps exercises operational responsibilities. Depending on the situation, operational level of war intelligence will focus on the intelligence requirements of theater, Army group, field Army, or corps commander.

Operational level of war intelligence is defined as that intelligence required for planning and conducting campaigns within a theater of war. At the operational level of war, intelligence functions concentrate on data collection that leads to the identification, location, and analysis of strategic and operational centers of gravity. These centers, if successfully attacked, will achieve friendly political and military-strategic objectives within a theater of war.

The IEW tasks performed at the tactical level of war (situation development, target development, EW, and CI support to OPSEC and deception) also are performed at the operational level of war. However, there is a greater degree of complexity involved to reflect the political, military, economic, and psychological elements of power. An operational level commander must successfully mesh these elements to realize strategic objectives.

Five IEW tasks are performed at the operational level of war: Situation development, target development, EW, security and deception, and indications and warning. Indications and warning involves the continuous development and refinement of regional or theater-based indicator lists. These lists allow operational level intelligence staffs to determine

changes in the political, military, or economic behavior of an enemy; this allows the theater commander to better anticipate and understand NCA actions which may lead to the decision for military involvement.

Theater-based all-source intelligence analysis is critical to theater commanders and the NCA (through the Worldwide Indications and Monitoring System). It prevents them from being strategically surprised. IEW tasks performed at the tactical level of war, and the elements and mechanics of each IEW task, are adapted to operational level requirements.

SITUATION DEVELOPMENT

Situation development, or IPB, at the operational level of war involves four functions: Theater area evaluation, analysis of the characteristics of the theater of war, threat evaluation, and threat integration. These functions focus on the joint and combined flavor of operational art and the political, military-strategic, monetary-economic, industrial, military, and psychological considerations of the theater commander.

Analysis of the characteristics of the theater of war involves terrain and weather analysis as well as an analysis of the geographical features of the theater, popular political support for US strategic goals, and the impact of neutral nations on military operations. Threat evaluation includes a doctrinal assessment of threat operational level forces--their composition, disposition, and initial deployment patterns--and considers morale of threat military forces; the political reliability of the enemy's military allies; the mechanics of nuclear release; and force-to-space ratios.

Threat integration at the operational level is concerned ultimately with a determination of the enemy's centers of gravity. In some instances, this center of gravity will not be enemy military forces but something less tangible, such as the enemy's will to resist, the strength of a military alliance, or a theater's reconstitution or sustainment effort. As the friendly campaign proceeds from one phase to the next, the enemy's center of gravity may change; hence, the anticipatory and predictive nature of IPB and intelligence analysis at the operational level of warfare.

THEATER AREA EVALUATION

The establishment of joint commands in geographical regions reflects the imperatives of American foreign and defense policy. Overall strategic goals for each theater of war are reflected in a number of documents to include Public Laws, National Security Decision Directives (NSDDs), and the Annual Defense Authorization Act. Specific military tasks and the defined theater of war are set forth in the JSCP. The Joint Operations Planning System (JOPS)--given the constraints of strategic mobility--defines what forces will be made available to a theater and when. On the basis of these documents and given clarification from the

NCA, a theater CINC will then assign strategic objectives to subordinate theaters of operation.

Theaters of war and supporting theaters of operations cross international boundaries. They include many independent nations of diverse ethnic, cultural, and linguistic backgrounds; and involve varied industrial and economic bases, with differing perceptions among citizenry concerning the severity of the political and military threat posed by an enemy. In addition, a theater AI will be defined. Given the criticality of the unimpeded movement of CONUS-based military forces to the USEUCOM wartime reconstitution and sustainment efforts, the theater AI of USEUCOM would extend to the eastern shoreline of the United States.

ANALYSIS OF THE CHARACTERISTICS OF THE THEATER OF WAR

The staff can turn its attention to an analysis of the characteristics of the theater AO once the operational level commander--

- Understands fully the political objective.
- Has determined the suitable military means to be used.
- Has considered the above issues.

The operational sandbox crosses international boundaries and includes major seas and mountain and terrain complexes; hence, theater area evaluation yields a continental-sized AO and an even larger theater AI. For example, the AO for USEUCOM includes the entire continent of Europe and the Mediterranean, with the AI extending well into the Western Military Districts of the USSR.

Terrain and weather analyses are components of a broader analysis of the characteristics of the theater AO. The significant geographic characteristics of the theater AO, to include topography and hydrography, must be considered. Seasonal climatic conditions often dictate when to launch campaigns and limit the strategies employed.

Other considerations would include disposition of transportation and telecommunications networks and facilities; economic, political, and social systems; the scientific and technological base; the extent of urbanization; and the state of national morale.

Templates can be developed for each of these factors which individually detail, for example, high ground water areas, superhighways, and their impact on LOCs, significant rivers and canals, and key terrain complexes. Figures D-1 through D-4 are examples of some of these templates.

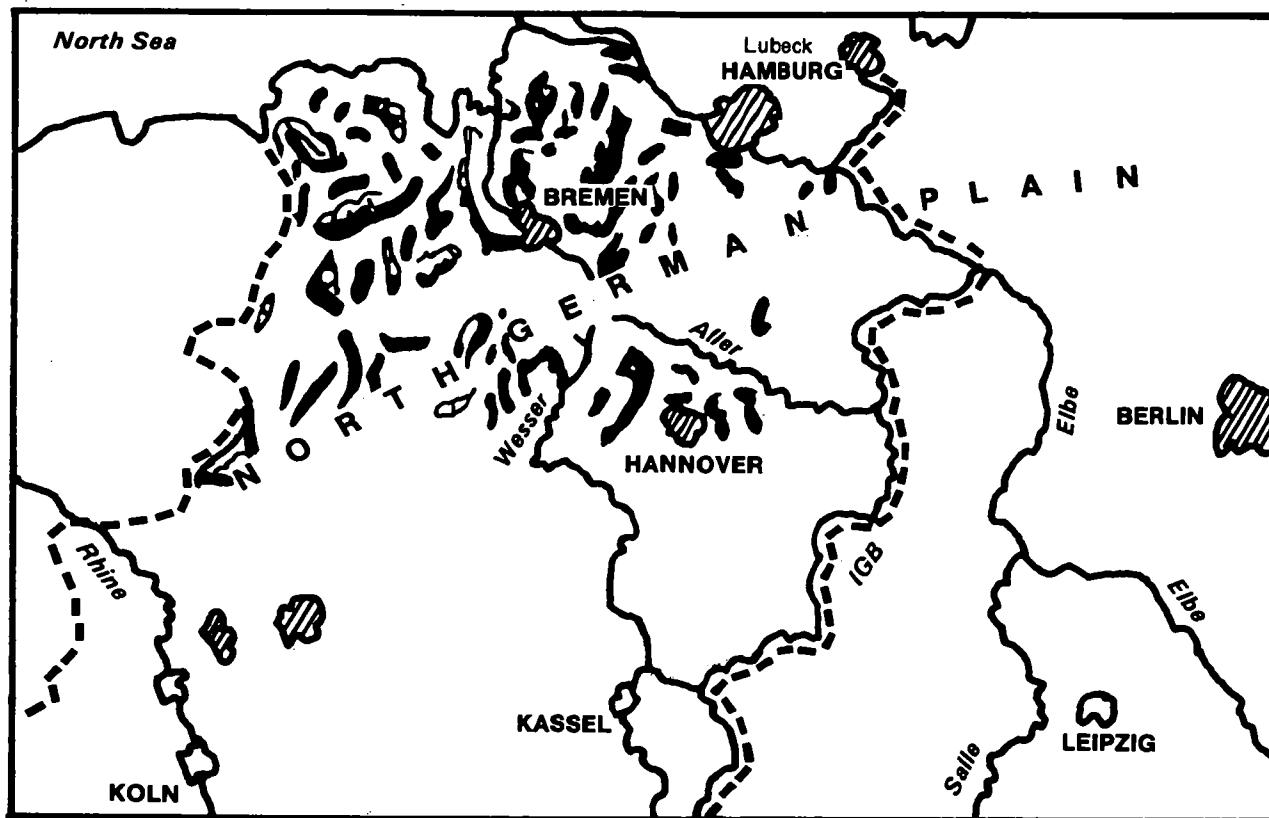


Figure D-1. High ground water areas template.

A prerequisite to operational level analysis is a broad stand-back approach to obtain a strategic appreciation and understanding of an area's natural features without being bogged down in detail. The templates will assist in identifying those characteristics of the theater AO which will impact the conduct of campaigns. For example, are there terrain complexes which could hinder or support the maneuver of corps or divisions? Are there critical border areas that limit the scope of operations on the ground and in terms of airspace control and management?

In terms of the operational significance of synthetic features, some considerations might be:

- How does the level of political, economic, scientific-technological development of the region bear on the kinds of forces (friendly and enemy) that might be employed?

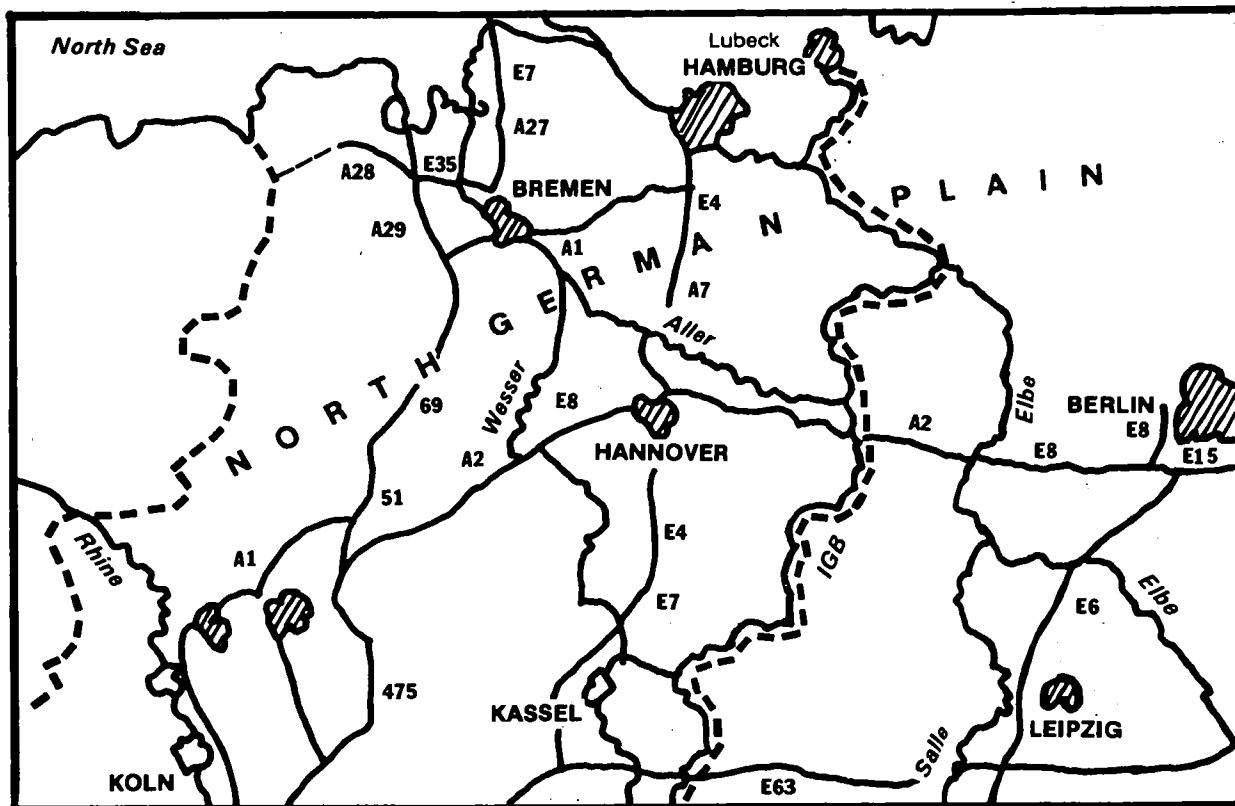


Figure D-2. Superhighways template.

- Are the existing rail, road, port, airfield, fuel pipelines, networks, and facilities suitable and available to support the likely courses of action?

The theater CINC focuses on the political-military and strategic implications of a theater's characteristics. Subordinate Army group commanders focus on regional peculiarities which will assist them in visualizing in broad terms the types of military operations that could be undertaken in a given region. For example, if an amphibious operation must be mounted, a wide range of factors peculiar to amphibious warfare assumes operational significance:

- What are the water depths and beach contour in a region's coastal area?
- What are the rise and fall of the tides?

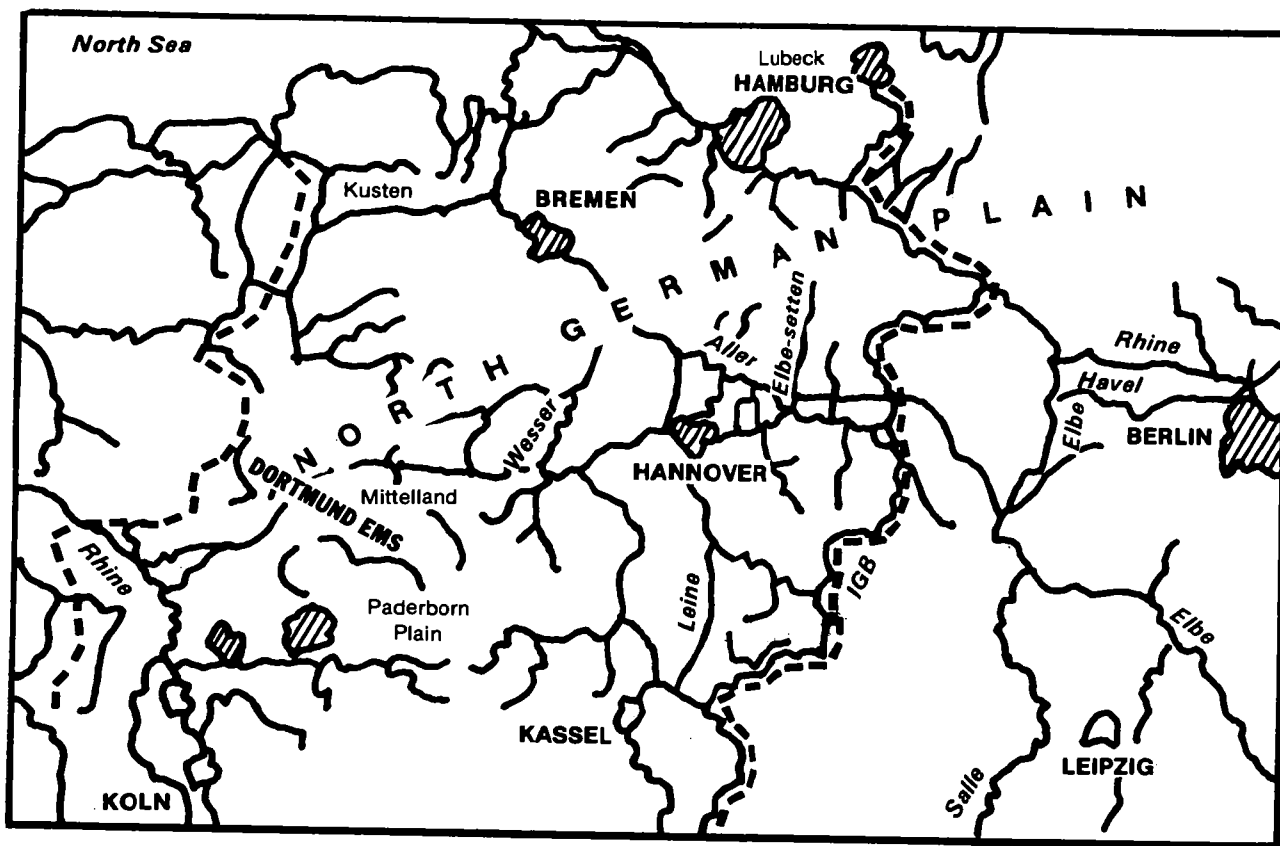


Figure D-3. Significant rivers and canals template.

- What are the strengths of the currents?
- What is the nature of the shore line?

Analysis of the operational significance of key terrain complexes, the hydrological network, urbanized terrain, and LOC yield an understanding of the broad operational axes of advance and associated avenues of approach available throughout a theater AO to enemy and friendly forces.

Seasonal weather conditions also play a key role in planning campaigns. Each theater is unique and has its own seasonal weather patterns, which are clearly shown by climatology. The USAF Environmental Technical Applications Center does special studies to support contingencies, and to provide a detailed analysis of the seasonal patterns for each prospective theater.

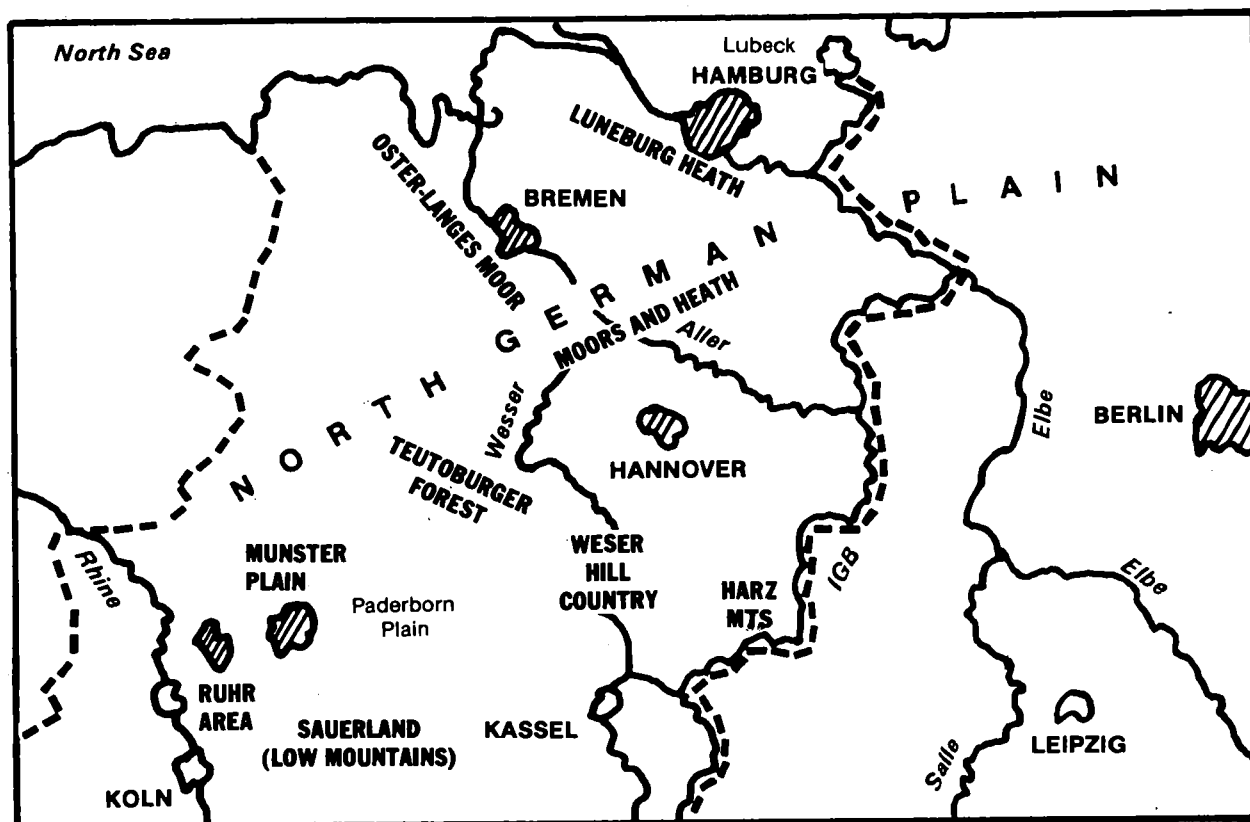


Figure D-4. Key geographical areas template.

In addition to the normal seasonal changes, monsoon or regional ocean-caused effects have major impacts on operational level planning. Planning for areas affected by such changes must be completed in advance of the planned operation in order to supply forces with the special clothing and equipment required to support commitment within the particular theater. The theater commander and staff must be aware of the historical weather conditions and patterns within the theater, identify the key weather-related operating factors, and make weather analysis an integral part of their operational level planning.

THREAT EVALUATION

At the tactical level of war, doctrinal templates are key to identifying the composition of a threat force, and reinforcements as well as a particular echelon that can be expected to employ its forces in a given AO. Local modification of these templates is based on further analysis and a continuously developing threat data base. At the tactical

level of war, the S2 or G2 orients on the readiness status of the enemy, the strength and location of committed and second echelon forces, and associated regimental and divisional artillery groups. Evaluation of the threat, in conjunction with weather and terrain analysis, yields that echelon's most probable course of action in the AO. At the operational level of war, however, threat evaluation involves those operational and strategic considerations of the enemy which in conjunction with theater area evaluation and geographic, political, demographic, and economic analysis will yield threat (and friendly) centers of gravity.

At the operational level of war, intelligence staffs focus on all forces available to the enemy in a theater of war. As an example, CINC, USEUCOM must consider the composition, strength, location, and disposition of Warsaw Pact forces throughout eastern Europe. The focus is not only on the second echelon fronts of the western TVD but also on the reserves located throughout the western military districts of the Soviet Union.

This analysis also will extend to air armies, naval forces (to include naval infantry), and strategic rocket forces. The Warsaw Pact logistics infrastructure and the effectiveness of its reconstitution-sustainment effort must be considered.

Other factors to consider include the anticipated time required to fully staff and equip second echelon forces, and the array of SOF deployed by the threat. Key concerns of the friendly theater commander include the targets of in-place SPETSNAZ throughout the entire theater of war, in particular those associated with command, control, communications, and intelligence (C²I); nuclear munitions and delivery systems; and support to the theater reconstitution-sustainment effort (major ports, airfields, and prepositioning of oversea materiel configured to unit sets (POMCUS) sites). The theater and subordinate Army group commanders also will be concerned with the targets and avenues of approach of OMGs.

The US theater commander also must determine not only the mechanics but also the politics of nuclear release authority to support conventional military operations. While the mechanics of nuclear release within North Atlantic Treaty Organization (NATO) are highly political, particularly within the NATO Military Committee and the Defense Planning Committee, the nuclear decisionmaking--by institutionalized allied relationships--is not thought to constrain Soviet political decisionmakers as they debate the release of battlefield and intermediate range nuclear forces to field commanders. The theater CINC must understand the procedures involved for a front commander to gain authority to employ battlefield nuclear weapons

and a TVD CINC to employ infantry, and at what stage of a campaign this qualitative change in military operations could be expected to occur.

Theater intelligence staffs will maintain data bases on strategic and political issues and relationships which have operational level implications. For example, the nature of the opposing military-strategic alliance must be assessed. Specifically, what is the operational significance of differences in the force structure, strength, composition, and disposition of other than patron-nation military forces? Can it be assumed that the enemy alliance will internally support the political and military objectives of the patron? Can the morale of client military forces sustain a major high-intensity conflict? Drawing lessons from the Great Patriotic War, the Soviets will recall what occurred opposite Stalingrad in 1942 when the Red Army defeated the Nazis by defeating those sectors of the front covered by the military forces of Rumania, Hungary, and Italy.

Considerations specific to the military forces of the patron include soldier morale and the operational impact that party functionaries permeating the entire military structure will have on the exercise of initiative and flexibility by commanders at all echelons. A military force that intends to use "blitzkrieg" tactics requires a highly flexible and innovative command structure. Success of the blitzkrieg strategy will depend in part on an operational commander's ability to render quick decisions without recourse to either superiors or time-consuming staff reviews.

A closely related consideration during the threat evaluation stage of operational level IPB is the enemy commander, in particular front and TVD commanders. This consideration is probably not a planning issue at the tactical level of war, as regimental, division, and (possibly) Army commanders have not developed a war-fighting style that can be discerned by intelligence analysts. Certainly, biographical intelligence is of prime concern to theater and Army Group joint intelligence directorate (J2) staffs as they attempt to determine the campaign styles of front and TVD commanders. Those senior Soviet commanders who served as platoon and company commanders during the Great Patriotic War, and who have been associated with certain cliques within the post-war Red Army, have internalized warfighting styles and decisionmaking methodologies which can be discerned and observed during Warsaw Pact peacetime training exercises. Understanding how enemy commanders organize their campaign (decision) planning efforts may inject predictability to the battlefield and ease the campaign planning endeavors of US theater commanders, which ultimately could lead to the identification of centers of gravity.

The overall process of C² and the decisionmaking and staff planning process that support Soviet Front and Army commanders is termed "troop control." As part of a post-World War II initiative to streamline and automate operational level planning, standardized decision methodologies were developed. Computer models were designed and military officers were trained in the use of mathematical decision aids to achieve speed, quality, and flexibility in the process of combat decisionmaking. Central to the troop control system is the relationship between the time required to plan for and render decisions and execute combat operations.

The system requires that the critical time (or the time required to execute a mission to realize the intended combat effect) is less than the time required to plan (control cycle) and execute (operational) combat missions. In order to minimize control cycle time, Soviet commanders use a standard planning process which incorporates standard mathematical calculations and also draws on specific intelligence information about enemy forces and a standard set of predefined norms.

Soviet planners consider the most likely forms of disruption to a campaign plan and formulate appropriate counteractions. The planning or troop control system is designed to minimize the likelihood of contingencies which will disrupt the plan and to provide the maximum capability to replan rapidly when disruption occurs. Studies indicate a series of standard combat indicators have been developed to gauge the success or failure of an operational or campaign plan during the execution phase. Further, the planning system provides prescribed operational courses of action when the plan is disrupted. The plan is sacrosanct. Permission from superior commands is required to alter the plan even when it is disrupted. And because Army planning or troop control interacts with nested Front, Army, and division decision cycles, each tempered by differing styles of decisionmaking, deep operations--orchestrated by a theater CINC--may prove the greatest threat of disruption to this mechanistic and scientifically based planning system.

The Soviet military planning process may incorporate operational vulnerabilities rooted in the scientific foundation for its development. As an example, the scientifically based planning norms developed in peacetime may prove unworkable in a time of war, particularly when operational level implications of geography, weather, allied support, and enemy (US and NATO) operational doctrine (AirLand Battle and Follow-on Forces Attack (FOFA) Doctrine) are considered. Second, Army commanders faced with the prospects of the operational level disruption of a Front campaign plan may not all exercise the initiative to counter the enemy's deep operations effort. Finally, operational level deep operations must necessarily focus on Soviet planning staffs and the combat automation systems which track OB and the status of an ongoing campaign.

THREAT INTEGRATION

The final stage of operational level IPB ultimately yields the enemy's strategic and operational centers of gravity. The operational level implications of a theater's geography, demography, political structure, and economic-industrial base are analyzed in the context of the military threat posed and those operational considerations addressed during threat evaluation. However, the breakout of hostilities between the military forces of two opposed alliances does not occur in the absence of a qualitative change in the political relationship between the alliance patrons. Figure D-5 shows an example of indications of offensive operations. High-intensity conflict in a theater of war would be preceded by a failure on the part of either superpower to continue to adhere to long-standing rules of behavior.

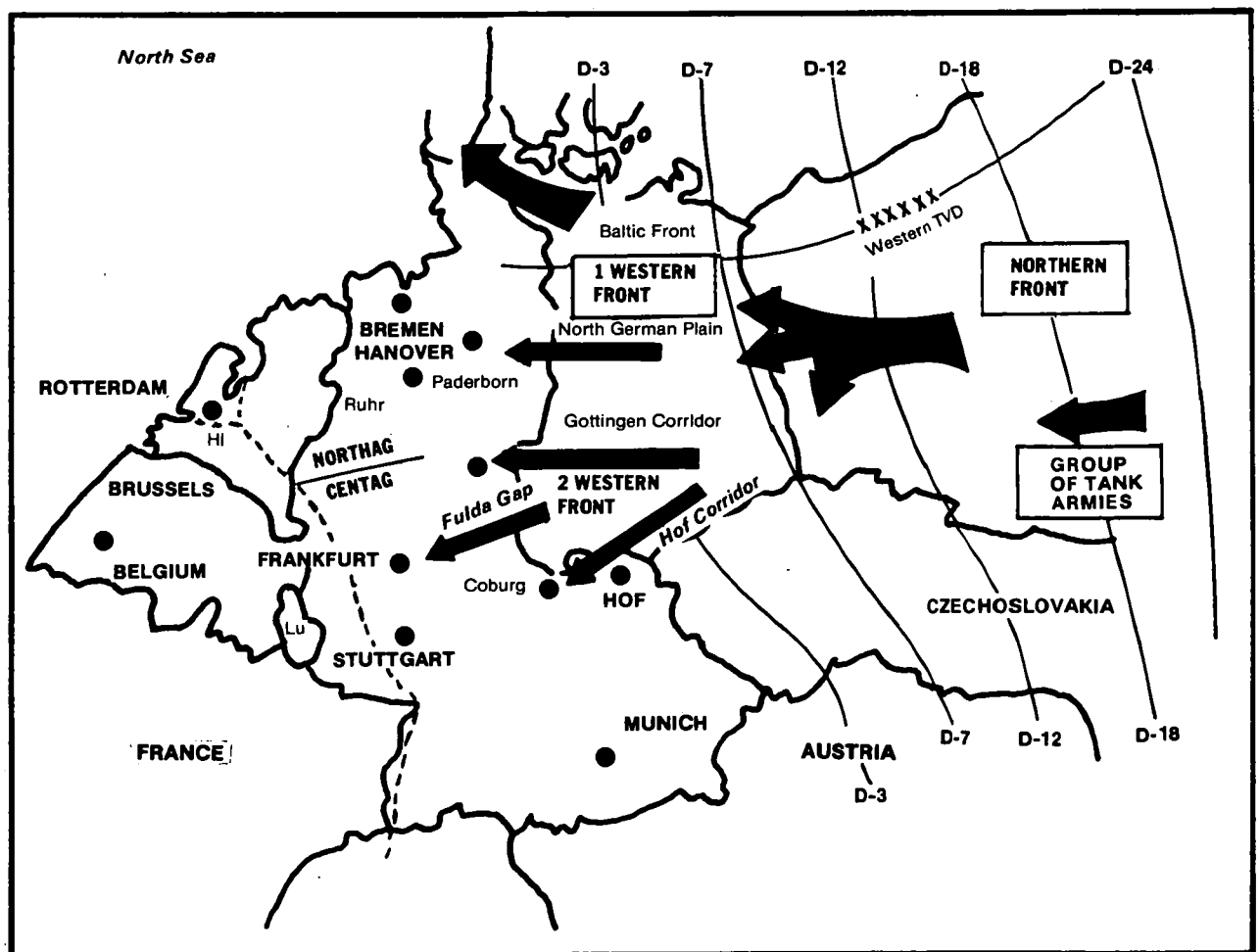


Figure D-5. Indications of offensive.

Heightened political, economic, and military actions would not occur without notice as the fifth operational level, IEW task (indications and warning), would key the theater commander and the NCA to a fundamental change in the political and military interests of the strategic intelligence agencies and systems (for example, political and military subjugation of the opposing alliance). The information gleaned during the performance of the second and third functions of operational IPB yields a broad picture of how an enemy alliance could be expected to fight and for what objectives. Just as threat integration is sequentially accomplished--at the tactical level of war--through the continuous development and refinement of situation, event, and decision support templates, the same intellectual process applies at the operational level of war, but with significant adaptations. Figures D-6 and D-7 show examples of friendly and enemy situation templates.

At the operational level of war, the situation template (friendly and enemy) reflects the broad geographical, demographic, political, and economic features of a theater of war. This data is gleaned from the numerous templates developed during the analysis of the characteristics of the theater AO. Additionally, the situation template shows the major axes of advance available to operational echelons and the political and military objectives of the combatants. An enemy situation template prepared by a theater J2 staff should note--on the basis of geographic and political analysis--the immediate, subsequent, and final objectives of the enemy within the theater and the location and disposition of forces under the C² of a theater commander. Both enemy and friendly situation templates focus on field armies, Army groups and combined arms army (CAA), tank armies (TAs), Fronts, TVDs, and theater air and naval forces.

Geographical features, such as river-crossings, national boundaries, canals extending for hundreds of kilometers, major cities and built-up areas, ports and airfields, and locations of strategic materials, are noted.

A doctrinal template of an army or front, is overlaid on the geographical region in question. Doctrinal frontages and operational-echelon configurations are adjusted to reflect geographical (terrain complexes, cities), political (neutral nation-states), and economic-industrial (location of strategic metals) constraints. This process of taking operational snapshots continues throughout the entire theater of operations. This projection of enemy military activity is critical to situation and target development, and capabilities analysis shows constraints on the employment of certain types of weapon-systems throughout the theater AO. Figures D-8 and D-9 show enemy and friendly weapon systems or force capabilities matrixes.

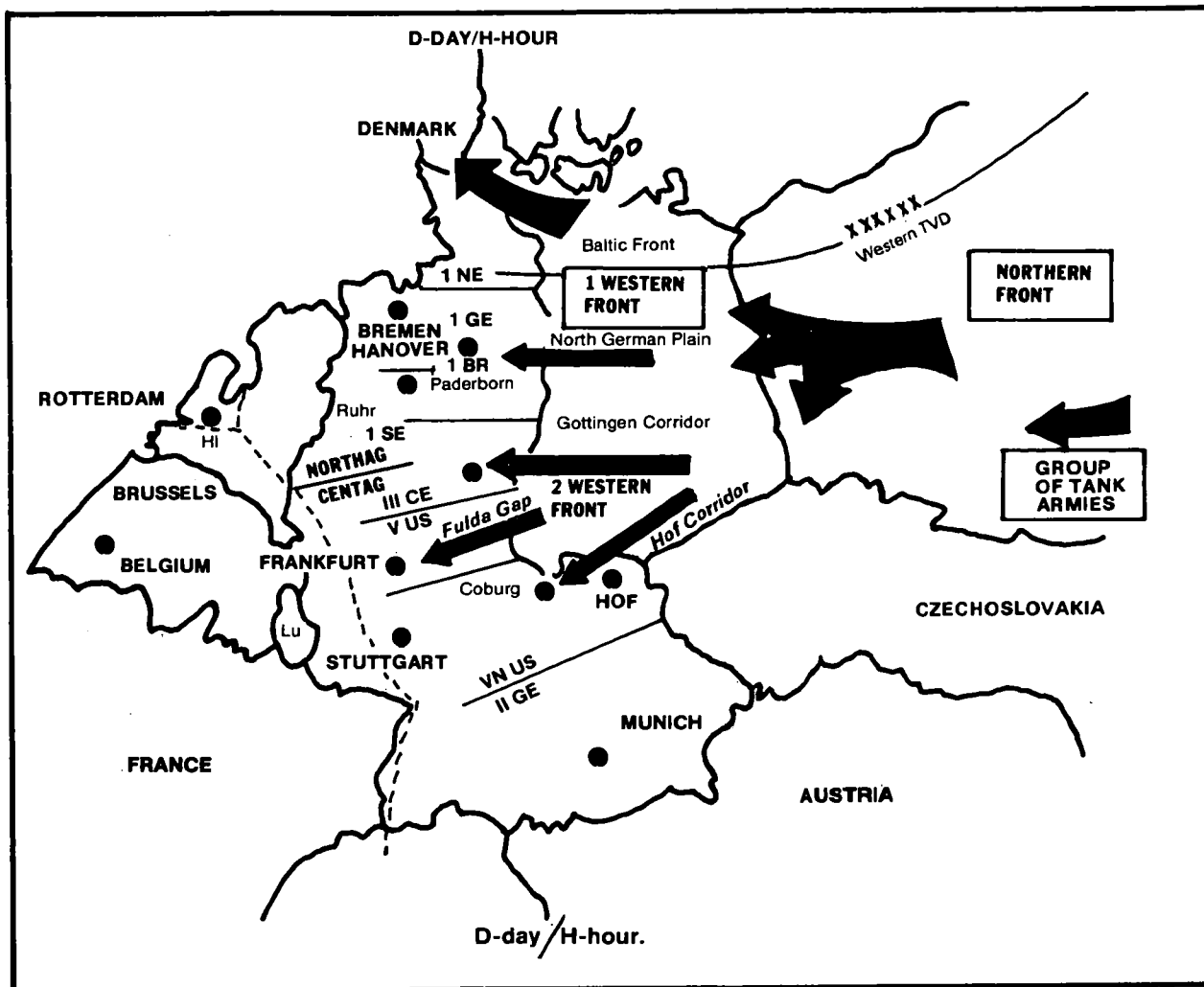


Figure D-6. Friendly situation template.

Given the enemy political and military objectives within a theater of war and available strategic and theater weapon-systems, J2 and Operations Directorate (J3) staffs can project both the friendly and enemy operational engagement scenario as the enemy's campaign plan unfolds. Theater commanders must also consider the array of combined theater weapon-systems available and the constraints associated with the employment of conventional and nuclear ground-based, naval, and airborne systems which support theater deep operations.

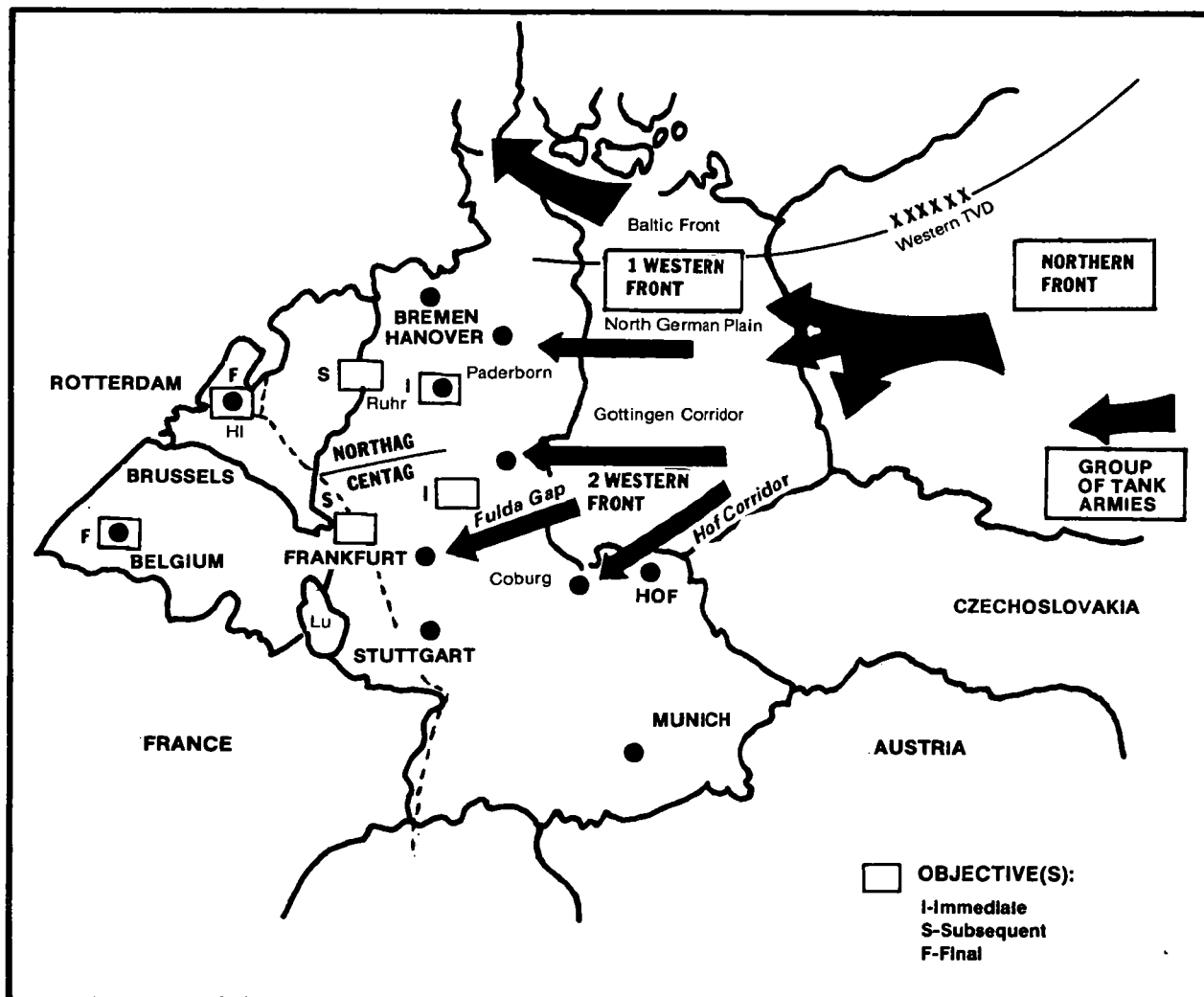


Figure D-7. Enemy situation template.

Situation templating is the basis for event templating. Figure D-10 is an example of a friendly event template of enemy forces.

Event templating is defined as the identification and analysis of significant battlefield events and enemy activities which provide indicators of the enemy course of action. At the tactical level of war, this involves the identification of NAIs along battalion and regimental mobility corridors and division avenues of approach which will confirm or deny a particular course of enemy action. At this level of war, NAIs can be a point on the ground, a hilltop, or a major road junction.

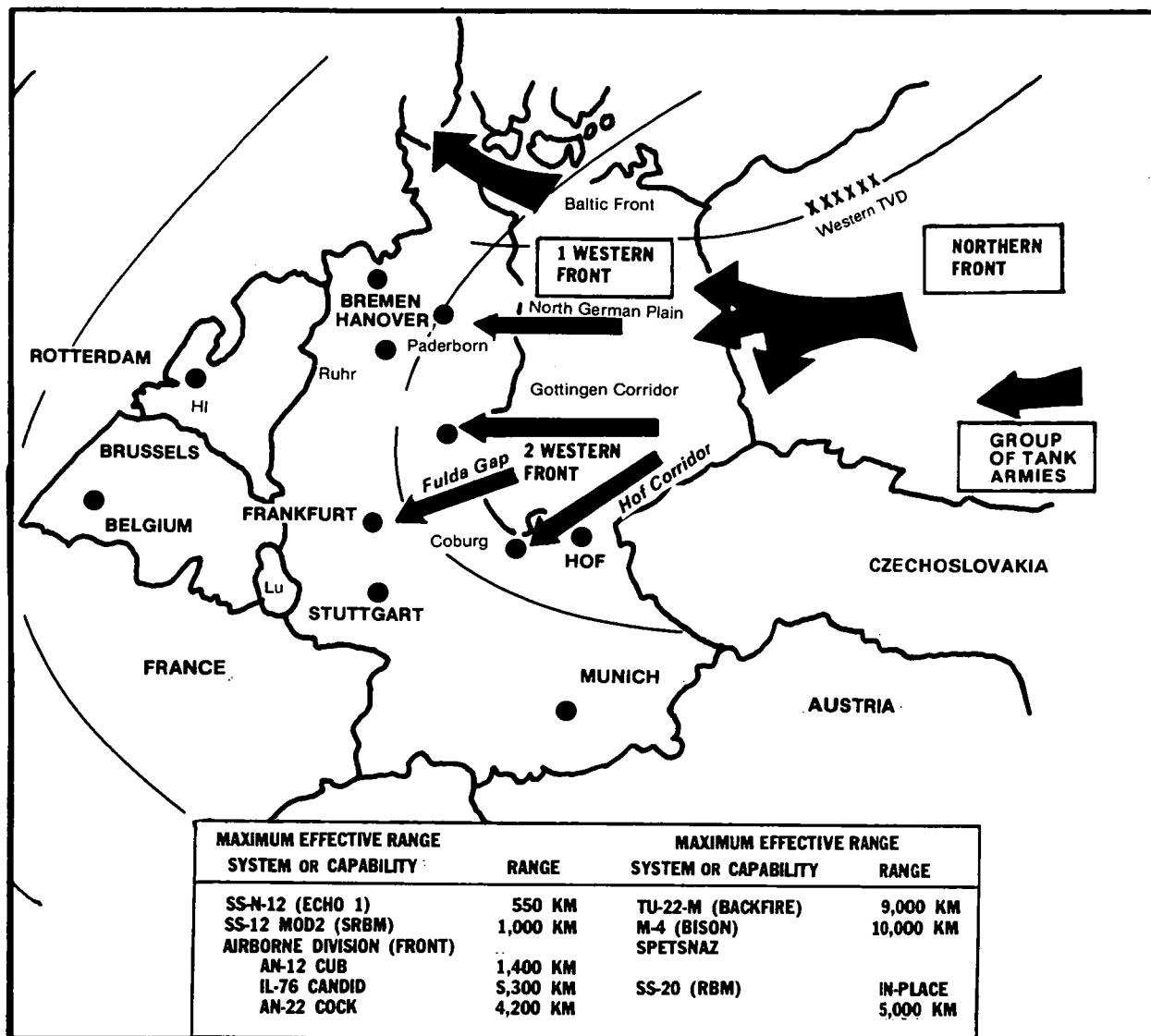


Figure D-8. Enemy weapon systems or force capabilities matrix.

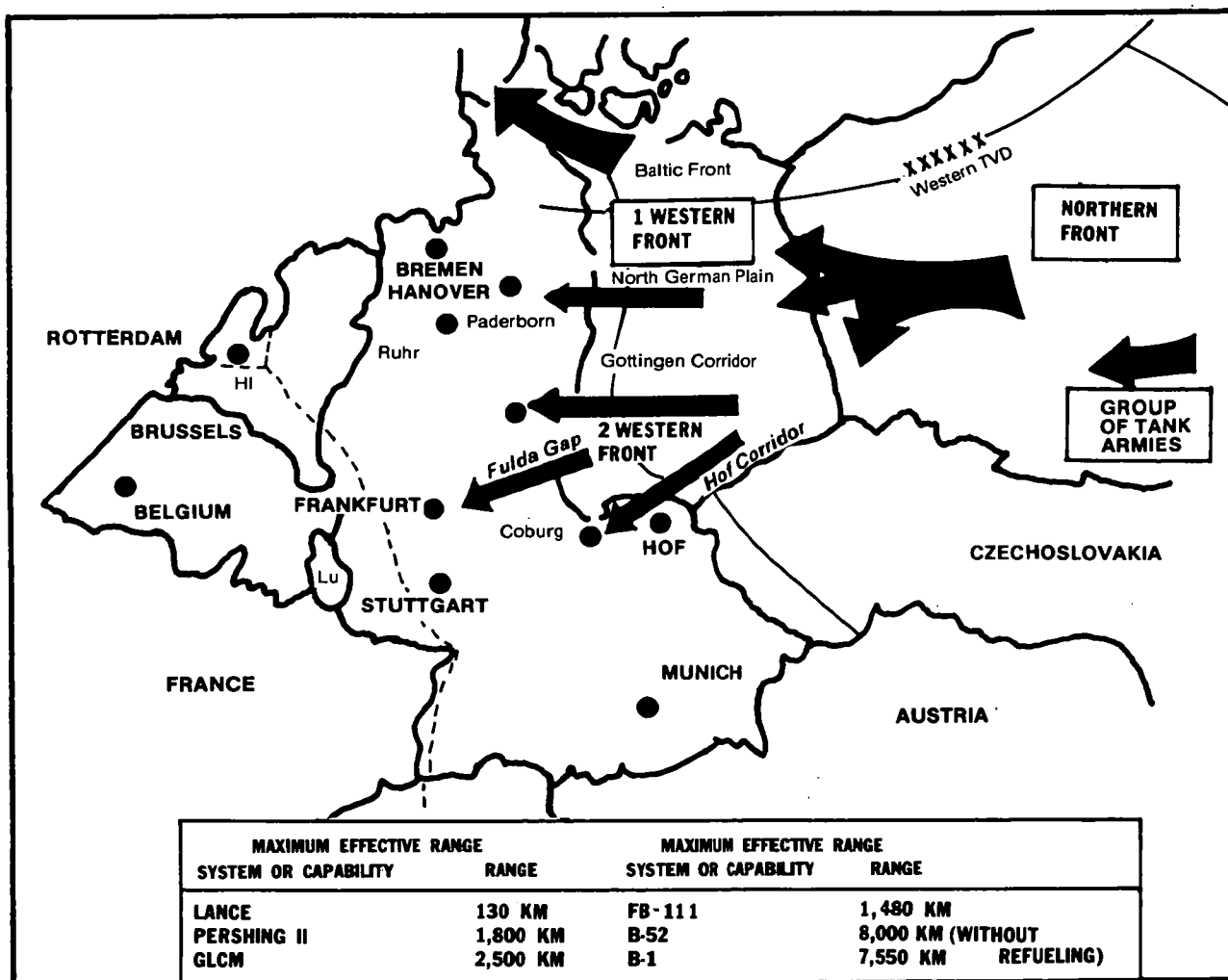


Figure D-9. Friendly weapon systems or force capabilities matrix.

At the operational level of war, however, the NAI is tied to a key geographical, political, demographic, or industrial feature of the theater AO, not necessarily located along an operational axis of advance. NAIs may also be front and theater second echelon forces, reserves, OMGs, the enemy commander, operational echelon automated troop control systems, intermediate range nuclear forces, and alliance solidarity.

Enemy movement in the vicinity of a key industrial or geographic feature may indicate priority of TVD effort being assigned to one front rather than another. Movement of second echelon fronts indicates priority of theater effort to a specific operational axis. Readiness and

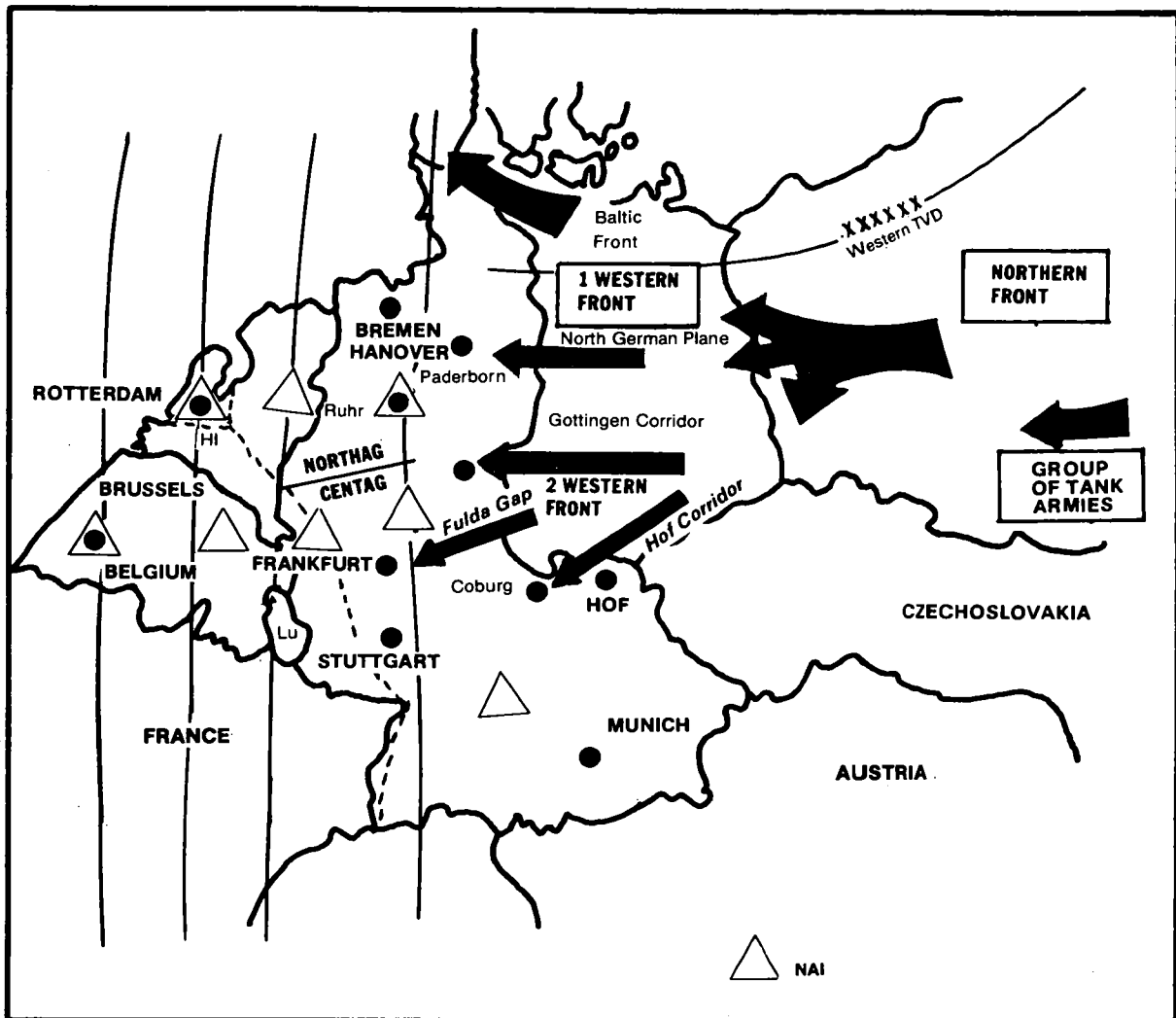


Figure D-10. Friendly event template of enemy forces.

positioning of infantry may indicate an earlier than assumed enemy willingness to employ nuclear weapons. Location of large quantities of multi-engine aircraft at airfields in the vicinity of airborne regiments and a front's organic airborne division may indicate the imminence of airborne or air assault operations directed against friendly rear targets. An NAI could also be a political or socio-economic development, such as a change in popular support for the political and military designs of the enemy or the willingness of neutral nation-states to permit military overflights.

The event template is designed to depict potential enemy courses of action of operational significance and how they relate to one another. Theater J2 staffs should prepare friendly event templates of enemy forces as well as enemy event templates of friendly forces. Given an understanding of the Soviet staff planning process and the campaign style of the opposing front or TVD commander, the J2 staff is in a position to discern the enemy's view (or perception) of the friendly theater campaign plan.

Time lines--expressed in days--based on doctrinal rates of movement assist in projecting threat movement throughout the theater AO. Event templating enables the J2 to develop theater collection requirements and to assist the J3 in the development of a theater C³CM strategy. Time lines (for example, D-1 or D-2 or D+1 or D+2) are also incorporated which reflect the political, military, and economic indications of conflict (developed from the Worldwide Indication and Monitoring System, the organizational basis for the fifth IEW task) from the decision of the enemy to alter long-standing rules of behavior, to initial mobilization, and the movement of major military formations.

Event templating results in the identification of significant events and activities of operational significance which considered in tandem with strategic military and political issues, alliance relationships, campaign style of an enemy commander, and centers of gravity. This is the purpose of the operational DST. Figure D-11 is an example of an enemy DST.

The operational level DST identifies those TAIs keyed to strategic and operational centers of gravity that, if attacked and not necessarily employing destructive systems, will defeat the enemy's strategic objectives. Operational centers of gravity may include major committed formations, theater reserves, C³I, LOCs, or SLOCs, and reconstitution-sustainment forces. Strategic centers of gravity might include the internal structure and solidarity of a political-military alliance, and the political and psychological will of a people to support and sustain strategic goals. The perspective of the operational command is necessarily broad, continuously focusing on the sequence of actions necessary to expose and defeat operational and strategic centers of gravity. Defeat of these sources of strength is essential to success and victory at the operational level of war, which is the realization of strategic goals within theater as defined in the campaign plan.

The operational level DST, which is a graphic representation of intelligence input to the campaign plan, incorporates decision TPLs which key the theater commander's decision to sequence the attack of TAIs as they relate to a larger operational or strategic center of gravity. Whereas the intent at the tactical level of war is to induce the enemy to undertake a less favorable course of action, the intent of targeting TAIs at the operational level of war is to defeat the enemy's strategic objectives and ultimately restore the political and military status quo.

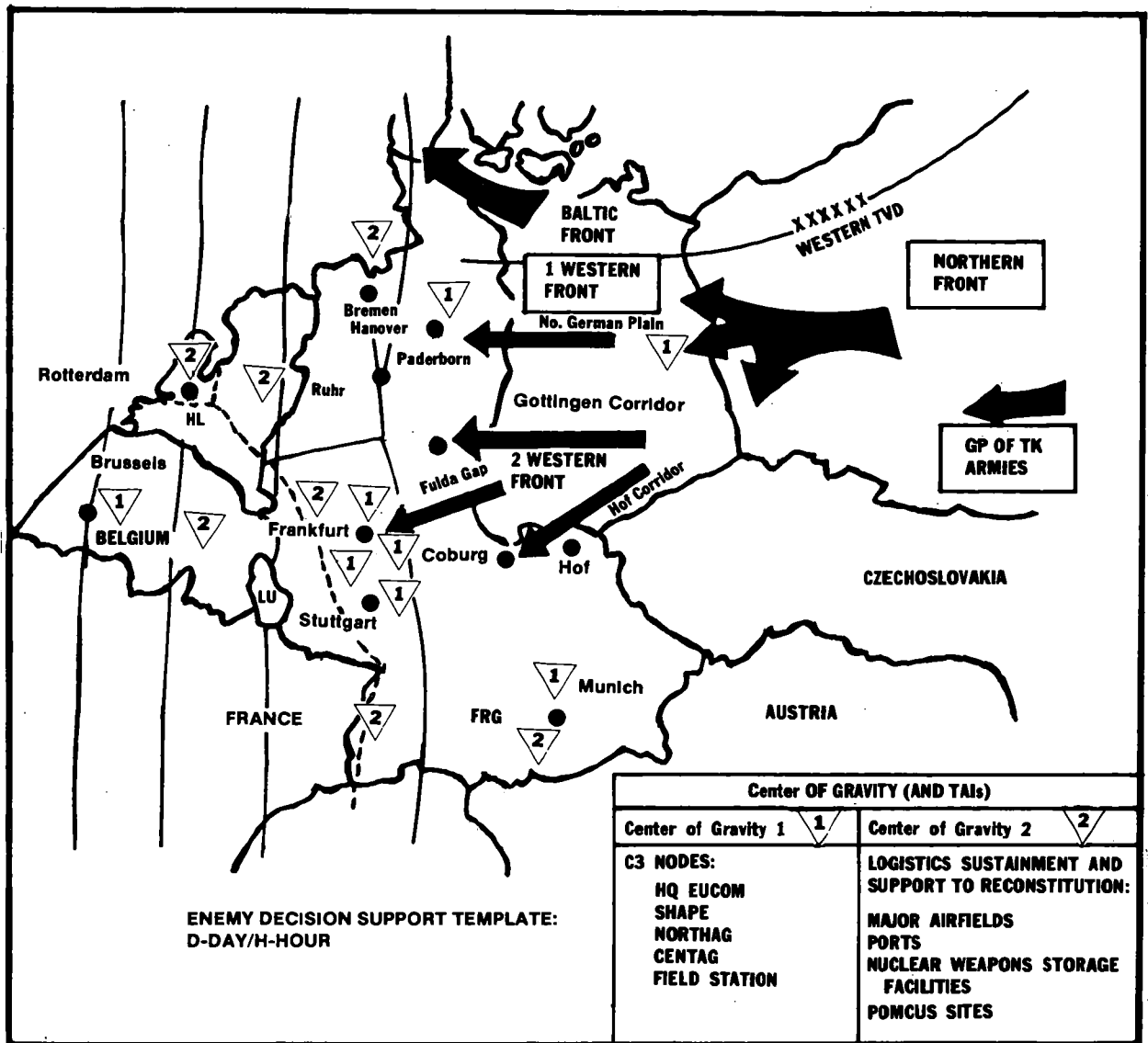


Figure D-11. Enemy DST: D-day/H-hour.

The definition of operational level of war intelligence prescribes the complex tasks of operational intelligence staff, which is the continuous identification and analysis of strategic and operational centers of gravity. Success of any campaign planning effort and the ultimate defeat of an enemy's political and military-strategic objectives in theater leads to the correct identification of these sources of strength.

Intelligence staffs must also project when an enemy force will reach a culminating point and assist in the design of major operations; this will speed up the occurrence of these potentially operationally devastating outcomes.

A prerequisite to the realization of operationally and strategically decisive ends are the collection, identification, acquisition, and analysis of the political, military, economic, psychological, sociological, industrial, scientific-technical parameters, and other qualitative considerations as they relate to a theater of war; the enemy (or alliance); and the political and military objectives. Operational level of war IPB provides a methodological framework which will facilitate the design and execution of victorious campaigns and major operations within a theater of war.

APPENDIX E

INTELLIGENCE PREPARATION OF THE BATTLEFIELD IN COUNTERINSURGENCY OPERATIONS

A modified form of IPB can be used to graphically portray the intelligence estimate to the commander in a COIN situation.

COUNTERINSURGENCY-UNIQUE FACTORS

These IPB modifications stem from three critical factors inherent to most COIN operations:

- The nature of the insurgent threat.
- The importance and welfare of the civilian population.
- The role of the host nation (HN) government and military.

THE INSURGENT THREAT

The insurgent will blend with the population and will also use a variety of tactics and levels of violence to accomplish goals (propaganda, terrorism, guerrilla tactics, crime, and so forth). While generic organizational categories and strategies have been identified, insurgents will seldom conform to a common mold. Building a threat model is key to the IPB process and, in COIN operations, the threat model must be developed based on the specific situation and geographic area of concern.

THE CIVILIAN POPULATION

Constant awareness of the population factor is critical to the long-term success or failure of tactical COIN operations. Foreign Internal Defense (FID) missions, in particular, will involve combat, combat support, and CSS operations near or among HN civilians. A primary objective of these operations will be to protect and secure the population and to separate them physically or psychologically from the insurgent. Such security and separation efforts may be required continuously. They will place heavy constraints on the indiscriminate use of weapons and require carefully managed use of force. Key to effective force management during COIN operations will be the extensive analysis of all aspects of the civilian population during IPB, as well as IEW target development, which deemphasizes support to indirect fire or air-delivered weapons in favor of proactive intelligence operations and small unit actions.

HOST NATION GOVERNMENT AND MILITARY

Ultimate success in COIN lies with the HN. HN civil and military authorities will be responsible primarily for military operations, civil affairs, PSYOP, and population resource control. Ideally, US forces will avoid these tasks, but may be required to provide advice or backup. Also, knowledge of the HN's military tactics and operations and intelligence

functions, coupled with their capabilities and limitations, will be critical for effective integration of a US military effort. Knowledge of the HN's history of human rights violations is necessary since pacification techniques that violate human rights, whether committed by HN forces or para-military groups, will influence civilian population attitude and support, and may conflict with US policy.

THE FIVE-FUNCTION PROCESS

The five functions of the IPB process as currently designed for conventional conflict allow for the effective integration of the COIN-unique factors discussed above with the required modifications. The five functions of the IPB process as they apply to COIN are discussed below.

BATTLEFIELD AREA EVALUATION

During this function, the analyst begins to collect data in order to fill basic intelligence requirements in six key areas: political, economic, social, geographic (demographic), military, and threat intelligence. It is here that key HN and population tactics are developed, along with the weather, enemy, terrain, and data normally collected for more conventional operations. This basic intelligence must be tailored to the specific battlefield area, and it is during this function that particular AOs and AIs are determined.

As in mid- and high-intensity conflicts, COIN AOs are designated by the next higher headquarters and represent the areas where the commander has the authority and responsibility to conduct operations. AIs are determined by the commander upon the recommendation of the G2 or S2. Both are analyzed according to METT-T, but in COIN operations an evaluation of both areas regarding ongoing HN civilian or military activity is also critical.

IPB should help the intelligence analyst answer two basic questions:

- Where can we expect to find the enemy?
- Where can we expect not to find the enemy?

The data to be developed and compiled varies with the intensity of the insurgent's operations. The types of overlays and categories of subjects plotted will vary according to actual mission requirements. Using a graphic keying system and color scheme on large-scale maps will greatly facilitate data analysis when superimposing transparent overlays.

TERRAIN ANALYSIS

Because insurgent forces are generally fewer in number than COIN forces and lack sophisticated logistics backing, they will normally avoid positional warfare. Usually, they will avoid seizing, controlling, or defending conventionally understood key terrain. Also, rapid foot movement across difficult terrain is one of the insurgent's greatest

assets. Therefore, traditional combined obstacles overlays will have limited bearing on the analysis of threat movement. The most important aspects of the terrain to the insurgent will be those which provide logistic support and security. Terrain analysis products will require detailed analysis of historical and current imagery, together with intelligence reports.

Key Terrain

Although the definition of key terrain (an area or locality, the seizure or control of which affords a marked advantage to either opposing force) remains the same in counter guerrilla operations as in other military operations, considerations involved in selection of key terrain differ significantly in counter guerrilla operations. In conventional operations, other characteristics such as the characteristics of the local populace and the logistical resources of the area play little or no part in selecting key terrain at this level; in fact, such aspects of the AO normally are considered by the G2 or S2 after selection of key terrain. In counter guerrilla operations, however, the determination of that terrain within the overall area which is key will be influenced greatly by these other characteristics; and full knowledge by the S1 of these matters as they affect the use of the AO by both the friendly and enemy forces is essential for selection of key terrain. For example:

- A village or town which has no tactical significance, but has psychological or political significance as a provincial or district seat of government.
- A coffee or rice field, especially during the harvest season, may have little tactical significance, but is important to the livelihood of the civil populace.
- A source of food. If the guerrilla force is known to have a critical shortage of food and a source of food (such as a market, rice storage, and so forth) is located within the AO, this may be key terrain because of the advantage it would provide to the guerrilla force.
- An LOC. Trails and roads frequently become key terrain in areas such as the jungle and extremely mountainous areas.
- A source of medical supplies. Medical supplies frequently are in serious demand by a guerrilla force; therefore, the area or locality of such supplies may be key terrain, because of the advantage that the seizure or control would provide to the guerrilla and because its denial to the enemy would provide the friendly force.

Population Status

The population is the key terrain during COIN operations. The population can provide both support and security to the insurgent and represents the only terrain feature which must be seized, controlled, or

defended. With the proper data base and collection effort, the G2 or S2 can begin classifying the population in the battlefield area into logical groups (tribal, religious, ethnic, political, and so forth). Their affinities and loyalties can be evaluated, graphically portrayed, maintained, and updated using the population status overlay. The G2 or S2 will normally rely on higher headquarters and HN and US civilian agencies for this type of information. Figure E-1 shows an example of a population status overlay.

Concealment and Cover

An insurgent concealment and cover overlay is prepared, identifying those areas the guerrillas can use for concealment and cover. Such areas could be due to the ruggedness of the terrain or the density of vegetation. As with conventional IPB, the canopy closure overlay identifies those areas which offer concealment from aerial observation or from elevated points of terrain. The effectiveness of canopy closure can vary with the season, whether it is winter or summer, rainy or dry. Figure E-2 is an example of a concealment and cover overlay.

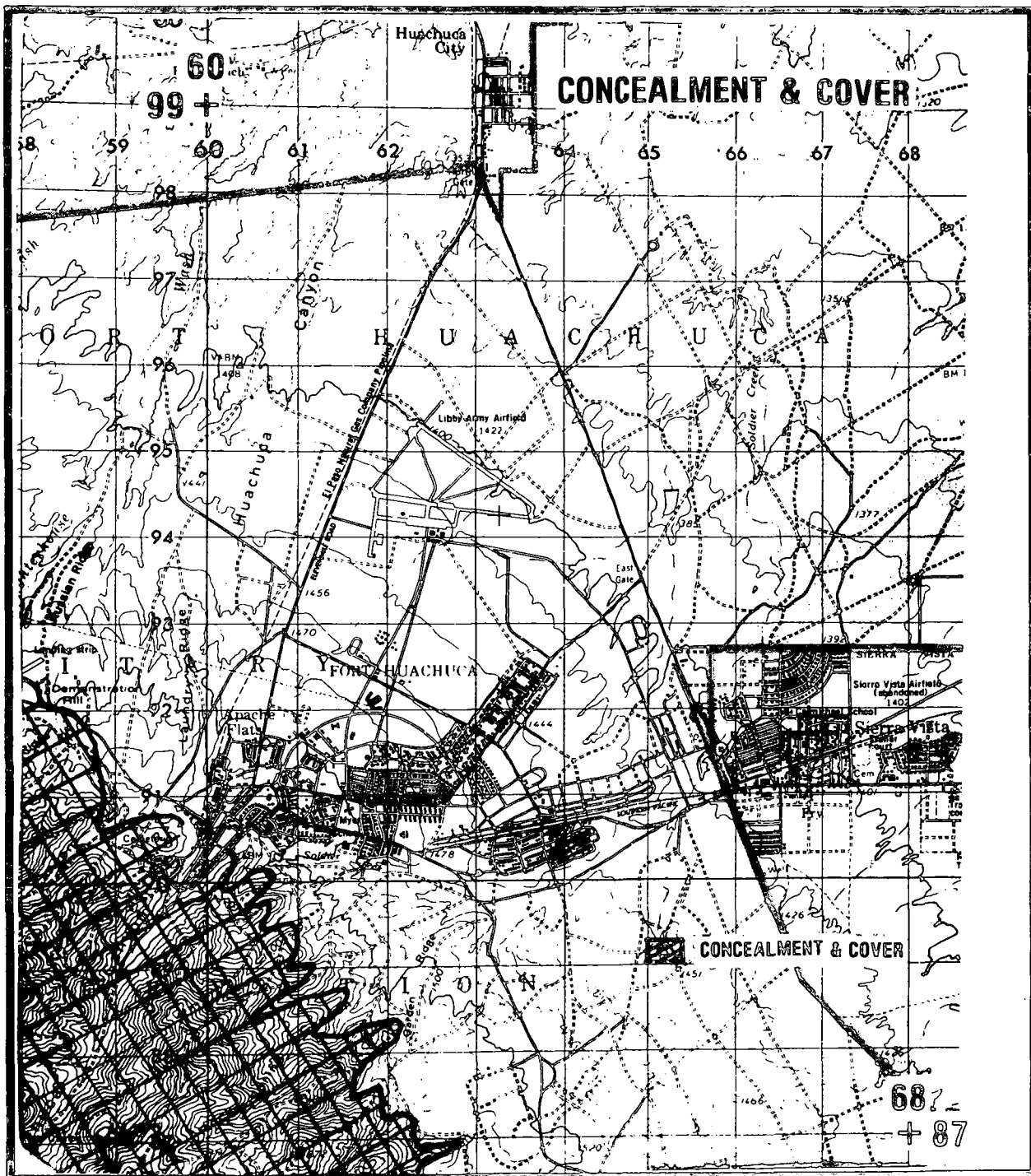
Insurgent Logistics Sustainability

An overlay is prepared which identifies those areas providing water and food to the guerrilla, or those areas that, due to their location, provide easy access to such supplies.

The combination of the population status, insurgent concealment and cover, and logistics sustainability overlays can identify those areas from where insurgents are likely to operate. Areas that provide concealment and cover, a friendly or neutral population, and ready access to supplies have a high probability of supporting insurgents. These areas can become NAIs for further collection in order to confirm or deny an insurgent's presence in the area or, with other indicators, determine the insurgent's intentions. Where areas of potential population or logistics support are well separated from areas of concealment and cover, the insurgent may move between the two. Two other overlays prepared during the terrain analysis process are the road or trail overlay (logistics sustainability overlay) and the trap overlay. Figures E-3 and E-4 show examples of these overlays.

The trap overlay identifies those targets the insurgent may find attractive to sabotage or attack. This may include bridges, power stations and transmission lines, sites that favor ambushes, or even likely kidnap targets. Such areas are marked on the map with attention directed to possible insurgent access and escape routes.

The LOC overlay highlights roads and trails in the operational area. Special attention should be paid to those LOC that are in potential insurgent areas, support a potential insurgent area, or are new. Many times aerial imagery can find new trails due to destroyed vegetation or by comparing current with previous imagery. In addition to roads and trails,



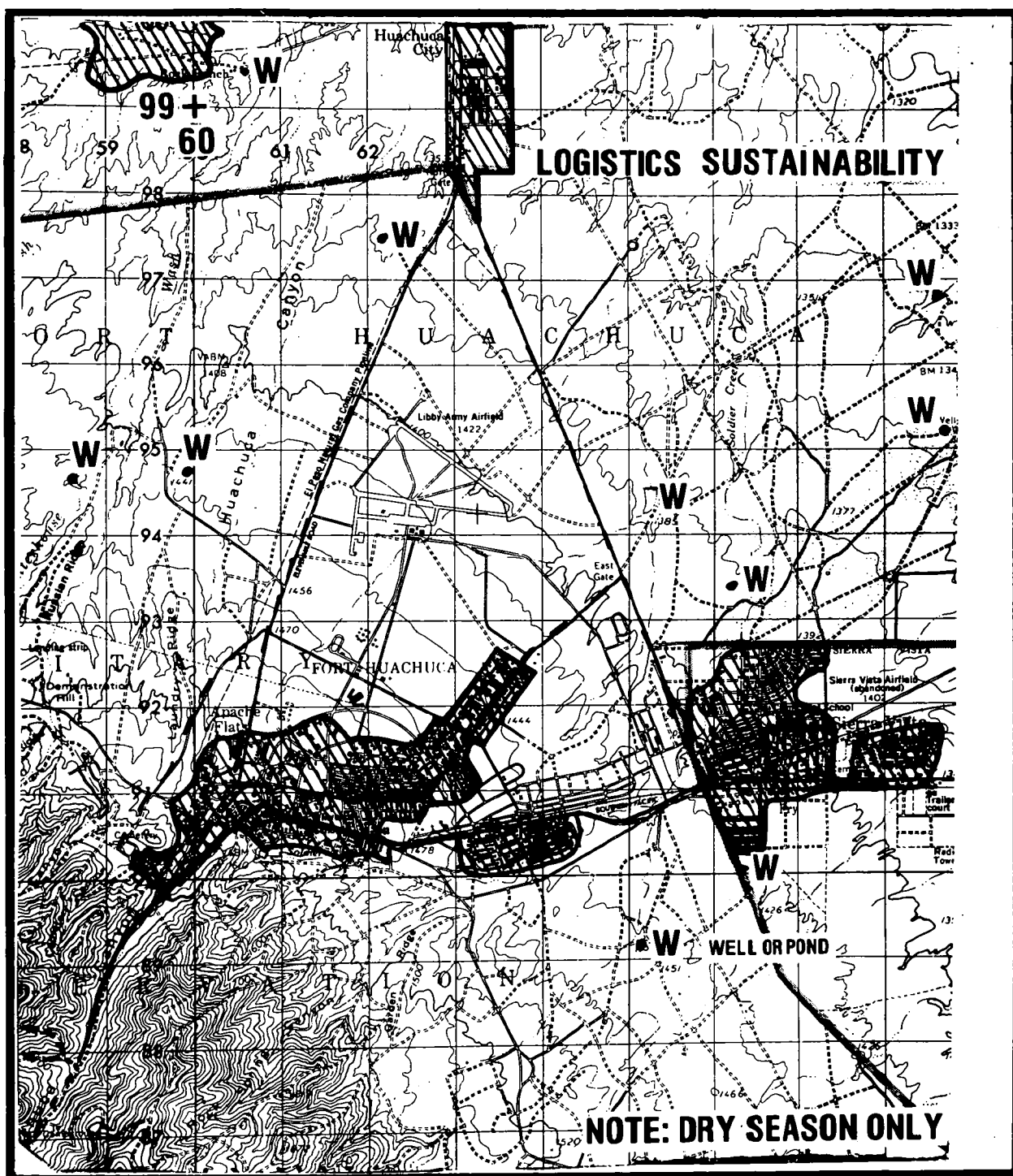


Figure E-3. Example of a logistics sustainability overlay.

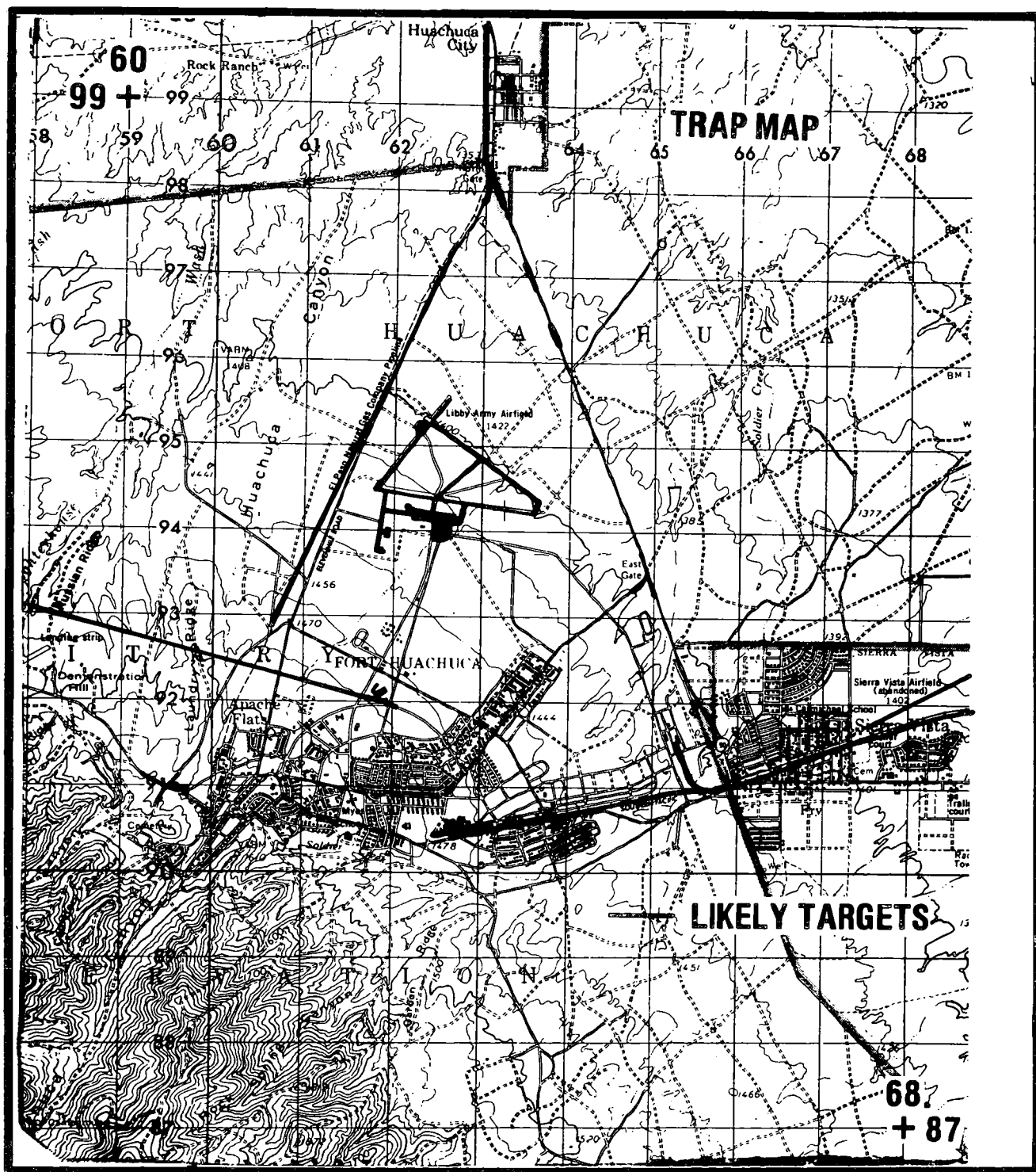


Figure E-4. Example of a trap map overlay.

waterways that can provide transportation for insurgents must also be considered when preparing the LOC overlay. Figure E-5 is an example of an LOC overlay.

Avenues of infiltration and exfiltration are identified as a result of considering the other military aspects of the terrain. While in conventional operations, the brigade S2 usually considers avenues of approach providing adequate maneuver space for at least a battalion, and the battalion S2 considers avenues adequate for at least a company; the peculiarities of guerrilla and counter guerrilla operations require departure from these norms.

Because the bulk of friendly operations will be in the nature of small unit actions and guerrilla actions involving company size and larger units are the exception rather than the rule, the criterion for identifying avenues of approach with adequate maneuver space is changed.

Both brigade and battalion S2's must identify and analyze platoon, section, and squad-size avenues of approach into areas and installations defended by their units and into objective areas. This should include an analysis of border areas used for transshipment of personnel or equipment into or out of the HN. In effect, they are concerning themselves with routes of infiltration and exfiltration. Because the brigade or battalion may frequently conduct semi-independent or combined operations, S2's must identify, select, and recommend not only ground avenues of approach but also air and water avenues. In each case, the principles of terrain analysis apply, emphasizing the specific details of terrain required for small unit operations.

No avenue of approach should be disregarded simply because the terrain appears impassable. In fact, those avenues of approach over difficult and seemingly impassable terrain normally offer the greatest opportunity for achievement of surprise by the counter guerrilla force. General avenues of approach can sometimes be identified by studying the population status overlay.

In many cases, it is likely that personnel or supplies may move through areas where the population is sympathetic to the insurgents. The S2 should remember that as with conventional operations, the map analysis used to determine avenues of approach must be supplemented with actual ground reconnaissance and current imagery analysis. Figure E-6 is an example of avenues of infiltration and exfiltration overlay.

WEATHER ANALYSIS

The same weather considerations and overlays generally will apply to LIC as to mld- and high-intensity conflicts. For example, weather effects on observation and Foff, camouflage, helicopter LZs, and LOS radio and radar equipment still apply.

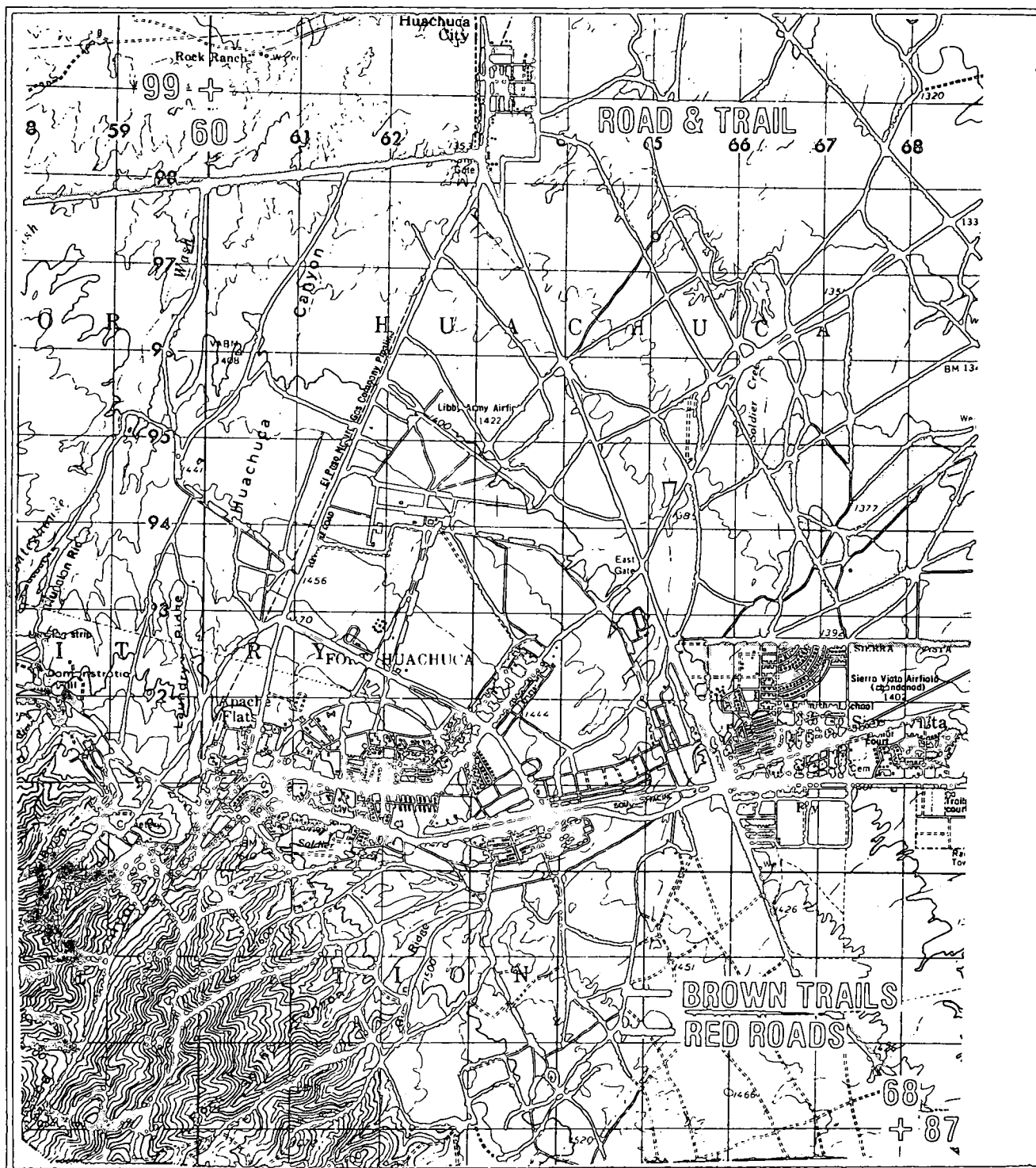


Figure E-5. Example of an LOC overlay.

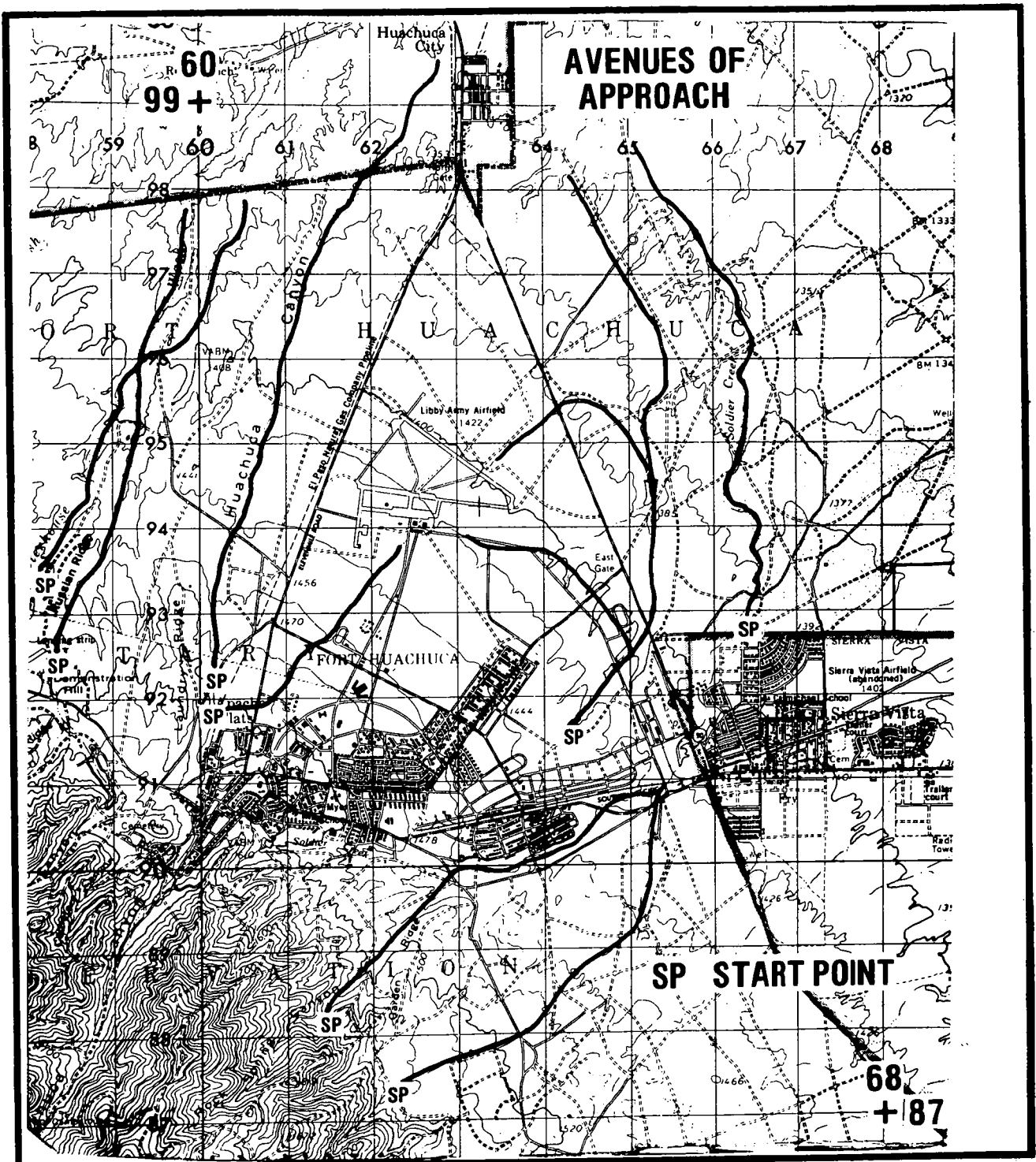


Figure E-6. Example of avenues of infiltration and exfiltration (avenues of approach) overlay.

A thorough knowledge of climatic conditions, as well as the usual evaluation of short duration weather forecasts, is essential to the S2's accurate determination of the effects of the weather on the unit mission. In the areas of great seasonal climatic change, terrain intelligence produced during one season may be practically useless in other seasons. Therefore, weather analysis, based on observed or forecast weather, and terrain intelligence must be produced and reviewed continuously to ensure their current applicability.

The nature of guerrilla and counter guerrilla tactics involves frequent combat action at extremely short ranges. Therefore, knowledge of the effects of the weather and natural illumination on visibility are critical for planning and conducting operations. The G2 or S2 attempts to determine the exact conditions of visibility at specific times of day in specific types of terrain. To confirm the estimate of the effect of the weather on visibility, the G2 or S2 reconnoiters representative areas of terrain under varying conditions of weather, particularly during the periods of nautical twilight.

Mobility is essential to both guerrilla and counter guerrilla force offensive operations. Therefore, knowledge of the effects of the weather on trafficability affect the timing and nature of operations. Normally, guerrillas rely primarily on foot movement, small watercraft, and animal transport. Therefore, the effects of the weather on wheel and track trafficability and upon air and amphibious mobility are usually more significant to the counter guerrilla force. Although adverse weather conditions frequently hinder the counter guerrilla force more than their guerrilla enemy (the flooding of rivers and streams), the creation or intensification of swamps and marshes seriously reduces the guerrilla's ability to move.

Other G2 or S2 weather factors to consider include the following:

- Guerrillas normally use bad weather or darkness to their tactical advantage. These conditions reduce the effectiveness of government force observation, direct fire, air support, and artillery--all factors which the COIN force has to its advantage.
- Weather can affect the availability of food supplies, such as crops and livestock.
- It is more difficult for insurgents to cache supplies in frequently flooded areas.
- Mass demonstrations are planned for predicted periods of good weather to ensure maximum turnout.
- Civil affairs projects and PSYOP media may be degraded by bad weather.
- Bad weather will degrade the poor road networks common in many active insurgent areas.

THREAT EVALUATION

Threat evaluation for COIN operations must begin early and cover a wide range of factors in order to build an accurate threat model. These factors include all aspects of the leadership, objectives, organization, tactics, external support, timing, and environment related to the insurgency. Doctrinal templates normally developed during the threat evaluation function are generally not feasible for COIN operations. This is not to say insurgents do not have tactical doctrine. It means that normally their tactics do not lend themselves to doctrinal templating. Despite the lack of insurgent doctrine that can be templated, every effort should be made during the threat evaluation to identify the insurgents' patterns of operation and tactics, and to identify specific targets which can be further analyzed and exploited during threat integration.

Enemy

After considering the weather and terrain, the S2 must consider the third element of combat intelligence--the enemy. Guerrilla tactics are usually characterized by small-scale operations conducted over an extensive area, hit and run offensive techniques, and withdrawal and dispersion instead of terrain defense. Although the guerrilla, like any other enemy, has the general capabilities of attacking, defending, withdrawing, and reinforcing, their capabilities may be implemented in ways and by means at variance with those encountered in conventional warfare.

Threat Data Base

The G2's or S2's first step in preparing for the production of intelligence on the guerrilla enemy is to engage in a detailed study of guerrilla organization and tactics in general, as well as that of the particular guerrilla enemy against which the unit is or will be engaged. As in conventional warfare, the effectiveness of the G2's or S2's planning and direction of the collection effort, the processing of information on the enemy, and the use of the resultant intelligence in the estimate all depend upon the G2's or S2's degree of familiarity with the enemy's tactics and techniques.

Prior to entry into the AO, the G2 or S2 must study field manuals and other texts on guerrilla warfare in general and special studies and handbooks on the particular guerrilla enemy of concern. Subsequent to entry into counter guerrilla operations, the G2 or S2 must continually refine the study of the enemy by personal observation and experience. Knowledge of the enemy obtained by personal experience is of the greatest use and significance only when it is based upon a solid foundation of understanding of the basic concepts and principles of guerrilla warfare.

Strength

Most guerilla forces fail to conform to the patterns we have regularly come to recognize as established military units in a strict strength accounting mode. Instead, they tend to tailor their operational cells to fit the need of a particular operation (at least until the final phase of the insurgency when their forces and operational pattern is established).

Guerrilla forces may be accounted for in terms of recognized military units (for example, squads, sections, platoons, and so forth) if their organizational structure is known and if such accounting provides meaningful information for the guidance of the commander and other members of the staff. If not, guerrilla strength may be accounted for in terms of total numbers, or numbers of units of particular strength. All crew-served weapons known to be available in support of the guerrilla forces are accounted for individually.

Evaluate Threat Capabilities

After collecting the available information on the guerrillas, the G2 or S2 evaluates what the enemy is capable of doing. Some of the important capabilities a G2 or S2 will have to judge are whether or not the insurgent is capable of--

- Conducting sabotage and, if so, to what extent.
- Attacking defended positions.
- Using indirect fire support.
- Directly engaging government forces.
- Collecting intelligence.
- Using mines and booby traps.

It is during this portion of IPB that the G2 or S2 prepares the insurgent SITMAP, which is one of two maps or overlays that must be used; the other is the incident map. The incident map includes all the relatively permanent information available on the insurgent such as information on insurgent camp locations, unit operating areas or boundaries, and trails. The incident map will be modified over time as the insurgent moves and capabilities change. Much of the information used to prepare and update the insurgent SITMAP (see FM 34-3) will be based on the incident map. Depending on the amount of activity in an area, it may be a good idea to lay the incident map over the SITMAP so immediate comparisons can be made.

At this time, the G2 or S2 reexamines the local civilian population. Although definitely not a threat, a clear understanding of the population beyond that of the population status overlay is needed. There the G2 or S2 gathers all the data available on local culture, customs, economics, or

any other factor pertaining to the civilian population that are needed to provide evaluations on how best to win over the population, or to evaluate the effects of operations in the area.

THREAT INTEGRATION

What we know about the threat is now integrated into the analysis of the terrain, weather, and population. Threat integration relates enemy doctrine to the terrain, weather, and population to determine when and where the insurgents may carry out a particular activity in support of their mission. It is during threat integration that the two critical decisionmaking aids--the situation template and NAIs--are developed. Generally, information to develop the situation template is gathered after arriving onsite. This is where the situation template varies from that of conventional IPB. Since there are no doctrinal templates developed during COIN operations, the situation template will be based not on formations and how they move but on types of activity, when and where they will occur, and where the guerrillas will have to be in order for them to occur. This information will be based on what is known about the local insurgent group's capabilities and on trends that have developed over time that indicate where and how it operates.

The first step is to identify the significant action or series of actions (mission) the insurgent may want to carry out. For example, will the insurgent--

- Carry out a direct attack against a fixed site?
- Attempt to isolate a town or region?
- Attempt to disable the region's economy?
- Use sabotage to carry out insurgent objectives?

Each of these missions requires different types of weapons, training, and tactics. Any serious, long-term attempt to disable an area's economy using sabotage would require additional insurgent training and explosives, and would require the analyst to consider likely sabotage targets. An attempt to directly attack, not harass, a defended town would require a more conventional military organization, better communications, advanced caching of supplies, and perhaps indirect fire weapons. The insurgents would also require an extensive intelligence gathering capability to attempt such an operation.

A situation template to analyze a possible significant insurgent attack against a defended point would require at least the following to be marked:

- Ambush points on friendly avenues of approach into the area.
- Possible assault positions.

- Possible locations for mortars within range of the target.
- Insurgent routes into assault positions or vicinity targets.
- Insurgent escape routes after the attack. Activity before the attack could include--
 - Increased caching.
 - Increased insurgent movement.
 - Increased sightings of insurgents in area.
 - Reoccupation or reverification of established camps within 1 to 2 days' march of the target.

One thing to remember in preparing a situation template is that many times insurgents will conduct several types of activity within a given area, and only through pattern analysis will the G2 or S2 be able to identify the insurgent's emphasis.

Situation templating identifies and analyzes significant battlefield events and enemy activities which provide indicators of probable enemy courses of action. NAIs are identified through terrain analysis and situation templating. From the trap map, NAIs are potential ambush points the insurgents may use. Combining the concealment and cover, logistics support and population status overlays identify potential insurgent camp areas which are also NAIs. From the situation template, routes, terrain features, or insurgent camps in the area become NAIs.

As with the doctrinal template, the DST generally will not be used. However, TAIs, based on the NAI, will be important. For example, a G2 or S2 whose unit is moving along a road will already have potential ambush points identified as NAIs. These points were previously targetted by collection assets before and during movement. They have also been coordinated as TAIs with the FSO and G3 or S3. If potential insurgent activity is identified within the TAI, then the commander can make the decision as to how to deal with it. Care must be given to confirming the activity as insurgent and not civilian related.

TVAs are also accomplished during this phase. HVTs are identified and can include CPs and logistics elements. An evaluation of specific insurgent capabilities is directly related to the identification of specific HVTs. For example, if the sabotage threat is high, HVTs would be locations of explosives or areas where sabotage training is being conducted. Individuals also can be HVTs. These include individuals whose death or capture would significantly degrade the insurgent group's leadership, espionage, population control, or operational capabilities.

CONCLUSION

IPB is an extremely important aspect of preparing intelligence for the commander. Faced with large AOs, a limited number of maneuver units, and finite collection assets, the commander must rely on IPB to provide battlefield focus. The G2s or S2s must determine, as closely as possible, the locations of insurgent elements in order to allow the commander the flexibility to act immediately against the enemy. As with mid- and high-intensity conflicts, for the commander to act immediately, IPB must be continuously updated.



APPENDIX F

ELECTRONIC PREPARATION OF THE BATTLEFIELD

Electronic preparation of the battlefield (EPB) and electronic templating are an integral part of the IPB effort. SIGINT and EW information is integrated into the doctrinal, situation, event, and decision support templates developed during the IPB process. IPB and EPB templates are created to portray graphically enemy dispositions, capabilities, and vulnerabilities, and to depict the enemy's capabilities to employ electronic systems throughout their AO for--

- Electronic countermeasures.
- C².
- Surveillance.
- Target acquisition.
- Maneuver.
- CAS and airspace management.

SIGINT, EW, and electro-optical information is integrated into DSTs to assist commanders and their staffs in the decisionmaking process by depicting critical points on the battlefield and identifying HPTs which, when exploited, provide friendly forces with an advantage. At ECB, EPB is a combined effort of the ASPS and the electronic warfare section (EWS) at the division tactical operations center (DTC) and the TCAE. EPB is accomplished as part of the initial IPB effort under the supervision of the G2 or S2. The G2 or S2 integrates EPB into the IPB process to verify enemy unit identification, unit locations, and unit types and sizes.

ROLES AND RESPONSIBILITIES

The initial IPB effort, to include the development of doctrinal, situation, and event templates and the intelligence portion of DSTs, is accomplished by the ASPS. The EWS of the DTC support element integrates SIGINT and EW information into these templates at a level of detail sufficient to satisfy targeting priorities and to determine the lethality of enemy EW systems. The DST is then forwarded, together with the MCOO, to subordinate elements, including the MI battalion, where they are further refined to meet functional mission requirements.

The event template may be forwarded to the MI battalion when the collection effort requires a standardized set of NAIs for all collectors. As the SIGINT and EW data base at the TCAE is normally more extensive than the data base of the ASPS and EWSs, the TCAE will normally review the templates received from the ASPS.

During this review, the TCAE will refine the templates by adding additional SIGINT and EW data base information. The refined templates will then serve to assist the TCAE in EW targeting and SIGINT and EW operations. Although the SIGINT and EW data base maintained within the ASPS and EWS will normally be sufficient for the initial IPB templating effort the EWS may, in certain situations, require additional information from the TCAE data base to prepare the initial IPB templates.

BATTLEFIELD AREA EVALUATION

The IPB process begins with battlefield area evaluation (BAE). The unit's AO and AI are defined during this phase. The AO is assigned by higher headquarters and is the same for both maneuver and EW operations. The AI is determined by the commander upon the recommendation of the G2 or S2. The G2 or S2 considers all dimensions of the battlefield, to include the electronic dimension, in determining the physical limits or bounds of the AI.

TERRAIN ANALYSIS

The second step of the IPB process--terrain analysis--involves a special consideration for SIGINT and EW operations. In addition to considering visual observation and direct-fire weapons FofF, the analyst must consider the electronic LOS characteristics of the terrain. By incorporating electronic LOS analysis into the development of the MCOO, the G2 or S2 is able to determine the probable disposition of enemy maneuver and FSEs and the communications and noncommunications emitters associated with C³ elements representing CPs, fire control radars, communications nodes, and so forth.

LOS analysis will also assist the G2 or S2 in determining the most likely locations for enemy electronic surveillance and countermeasure systems. By applying these elements to situation, event, and decision support templates, the analyst can determine those points on the ground which the enemy will probably use to communicate and employ noncommunications emitters, such as target acquisition and fire control radars, electronic battlefield surveillance (communications intelligence (COMINT) and electronic intelligence (ELINT)), and electronic countermeasure (ECM) (jamming) systems.

Similarly, applying the elements of electronic LOS analysis to situation, event, and decision support templating will assist the commander, G3 or S3, FSO or FSE, G2 or S2, and the other staff officers and functional unit elements in providing counter-SIGINT, counter-MASINT, and determining where to place friendly communications emitters to maximize effectiveness while denying direct LOS to enemy electronic warfare support measures (ESM) and ECM systems; to maximize the effectiveness of friendly target acquisition and fire control systems; and to maximize the effectiveness of friendly ESM and ECM operations.

WEATHER ANALYSIS

The third step of the IPB process, weather analysis, is normally performed simultaneously with terrain analysis. The commander must consider the effects of weather on the placement and employment of friendly and enemy communications, noncommunications, ESM and ECM units and systems. The potential effects of weather on the electromagnetic (EM) spectrum also must be considered.

As with maneuver elements, weather will influence cross-country mobility and emplacement of communications and noncommunications elements, facilities, and emitters. Extreme hot and cold temperatures affect sensitive electronic equipment and personnel efficiency. Dust and humidity cause damage to electrical connections and the rapid deterioration of internal electronic components. Electrical storms create high intensity EM surges which can fuse relays and damage circuits.

Modern microcircuitry is particularly susceptible to damage from EM surge. Sunspot activity can have an adverse effect on all types of HF and very high frequency (VHF) communications. Blowing dust, snow, rain, and drizzle can reduce the effectiveness of early warning, GCA, target acquisition, and fire control radars to varying degrees, depending on the actual conditions and the specific system.

THREAT EVALUATION

The fourth step in the IPB process--threat evaluation--involves the development of the threat data base, the evaluation of enemy capabilities, and the creation of doctrinal template files and electronic and electro-optical node template files and overlays. From a SIGINT and EW standpoint, threat evaluation involves developing an extensive electronic OB data base on the threat and performing a detailed evaluation of the enemy's communications, noncommunications, and REC capabilities. The data base contains the doctrinal numbers and types of communications and noncommunications emitters representing functional nodes such as CPs, ground-controlled intercept (GCI) sites, and electronic surveillance and ECM systems found at each enemy echelon and unit. When the electronic OB data base is as complete as possible and enemy capabilities have been thoroughly evaluated, the information is integrated into doctrinal templates.

Doctrinal Templates

Doctrinal templates convert all types of enemy OB information into graphic displays. They depict frontages, depths, and boundaries and show how the enemy would like to deploy their forces and associated electronic emitters, surveillance, and countermeasure systems if not constrained by weather and terrain. Doctrinal templates which depict enemy EM nodes are based on and coincide with the doctrinal templates developed for various types of enemy operations such as attack, hasty and deliberate defense, and pursuit. These templates provide the basis for determining the EM signatures of enemy combat and combat support units, C² facilities, and jammers arrayed against friendly forces.

Doctrinal templates are prepared prior to the onset of hostilities and placed in the doctrinal template file. Once hostilities begin, doctrinal templates depicting electronic nodes are used to provide direction and focus to the EW targeting and the SIGINT and ESM tasking and prioritization efforts.

Doctrinal Template Development

The EWS of the DTOC support element will provide the enemy SIGINT and EW information required for the development of doctrinal templates and will assist ASPS analysts in integrating this information with other OB during template development. Production of doctrinal templates and the maintenance of the template file are under the supervision of the G2 or S2, who continually inspects the file to ensure that the latest and most current information available on enemy doctrine has been included.

Normally, separate doctrinal templates contain enemy communications and noncommunications emitter information. While this creates two doctrinal templates for the same function being evaluated, it serves to eliminate clutter on each template. The templates include the number and type of emitters associated with each enemy electronic node. The level of detail and the classification of the templates depend on the requirements of the command. Figures F-1 and F-2 show examples of doctrinal templates with communications and noncommunications emitters.

Electronic Node Templates

The TCAE is responsible for critical communications and noncommunications node analysis in support of single-source SIGINT operations. The TCAE's analysis is more detailed than the ASPS and EWS node analysis which is limited to electronic node identification in support of situation and target development. The electronic templates produced as a result of the TCAE's analysis are more detailed than those produced by the ASPS and EWS, but are not necessarily required by the ASPS or CM&D section unless they apply to specific PIR and IR.

Although the TCAE has access to the doctrinal template file maintained by the ASPS, the information shown on the ASPS products is not detailed enough to support TCAE analytical requirements. The TCAE therefore, develops electronic node templates to augment the ASPS products and assists the TCAE's internal analytical effort. The electronic node template contains the same information as the doctrinal template, but adds the specific emitter and technical information required by SIGINT analysts within the TCAE. Since it contains the nomenclature and technical characteristics of specific emitters and systems, the classification of the electronic node template is higher than that of the doctrinal template it replicates.

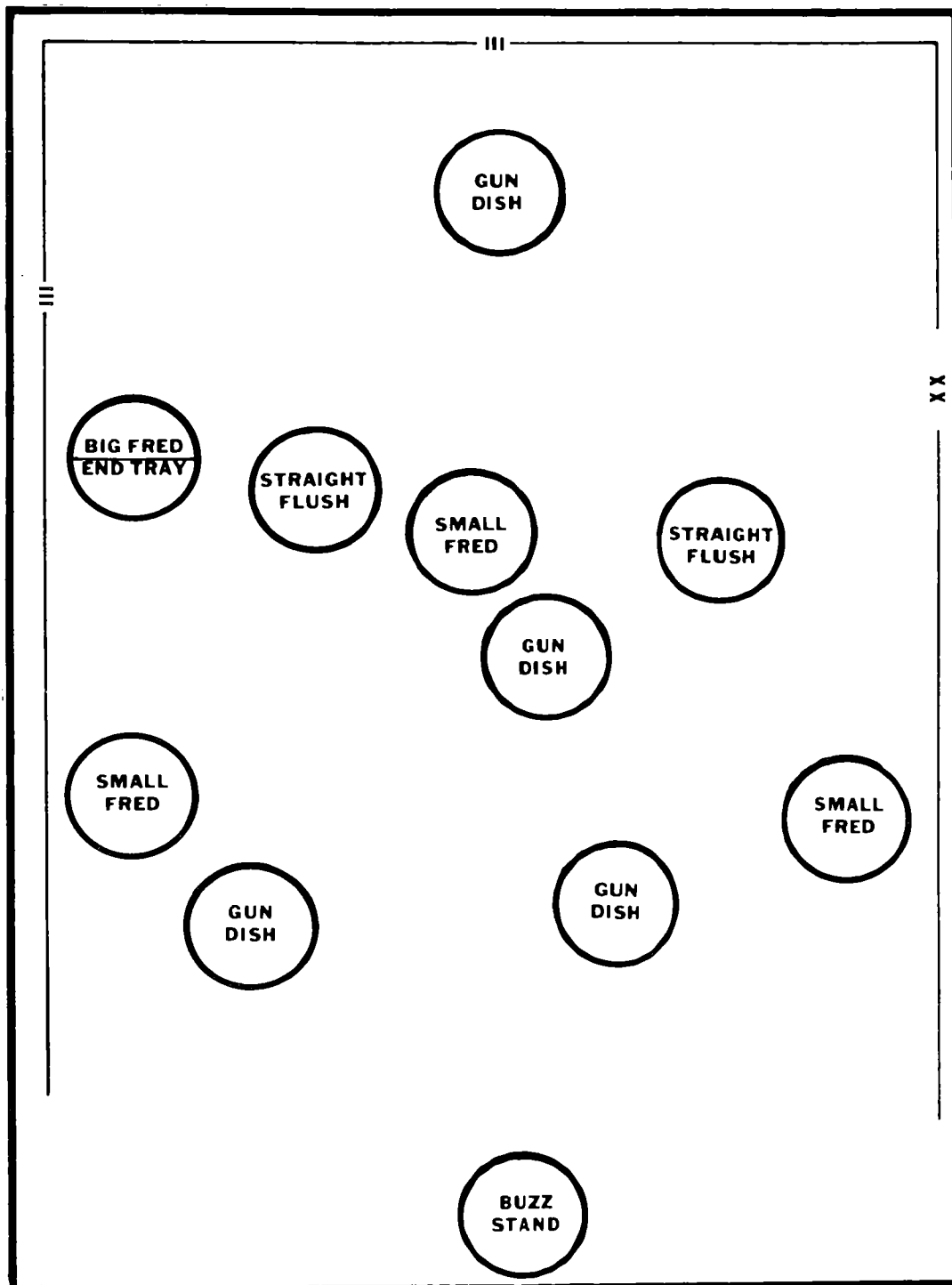


Figure F-2. Doctrinal template: MRR (attack) noncommunications emitters.

Electronic Node Template Development

The methodology employed in visually depicting electronic nodes is intended to coincide with common graphics in other Army functional areas, and consists of a circle divided into sections. Each section represents a single communications or noncommunications emitter within the node. The sectioned circles represent singular enemy electronic nodes rather than units and formations. These nodes are currently described by their electronic communications and noncommunications emitters in signals parametrics analysis of potential critical nodes (SPAN) products and in the Soviet Battlefield Development Plan (SBDP). Thus, for example, the entire range of critical electronic nodes associated with a Soviet motorized rifle regiment (MRR) will be depicted rather than depicting the regiment as a single node.

These nodes may include the regimental main and forward CPs, the individual MRB CPs, air defense control points, ground-to-air control points (FAC vehicles) artillery command and OPs and firing points. As SIGINT collection and analysis can identify and position these nodes with relative accuracy, the overall or cumulative depiction of the regiment is portrayed on an avenue of approach or a mobility corridor. Each critical electronic node can be filed or cataloged in the doctrinal template file or in an automated data base.

As ESM or SIGINT operations collect data on the electronic dimension, this data with locational information applied is used by the SIGINT analysts to determine, by the processes of confirmation or elimination, the nature of each electronic node and, in turn, the unit or function these nodes identify. This is the essence of SIGINT and ESM as it supports ECM operations. Figure F-3 is an example of a single electronic node and its associated communications and noncommunications emitters. SIGINT collection activities focus on the presence or absence of the numerous emitters that identify the node.

THREAT INTEGRATION

The fifth step of the IPB process--threat integration--involves the development of situation, event, and decision support templates. The initial development of these templates is a function of the ASPS. The EWS assists the ASPS analysts in integrating SIGINT and EW information into the templates. At the DTOC level, the integration of SIGINT and EW information is largely in support of situation and target development. Subordinate elements, including the MI battalion TCAE, refine the templates developed by the ASPS and EWS to the level of detail required to support their functional mission requirements.

Situation Templates

Situation templates are doctrinal templates with weather and terrain constraints applied. Situation templates graphically depict how an enemy force will appear at given times as it moves along an avenue of approach

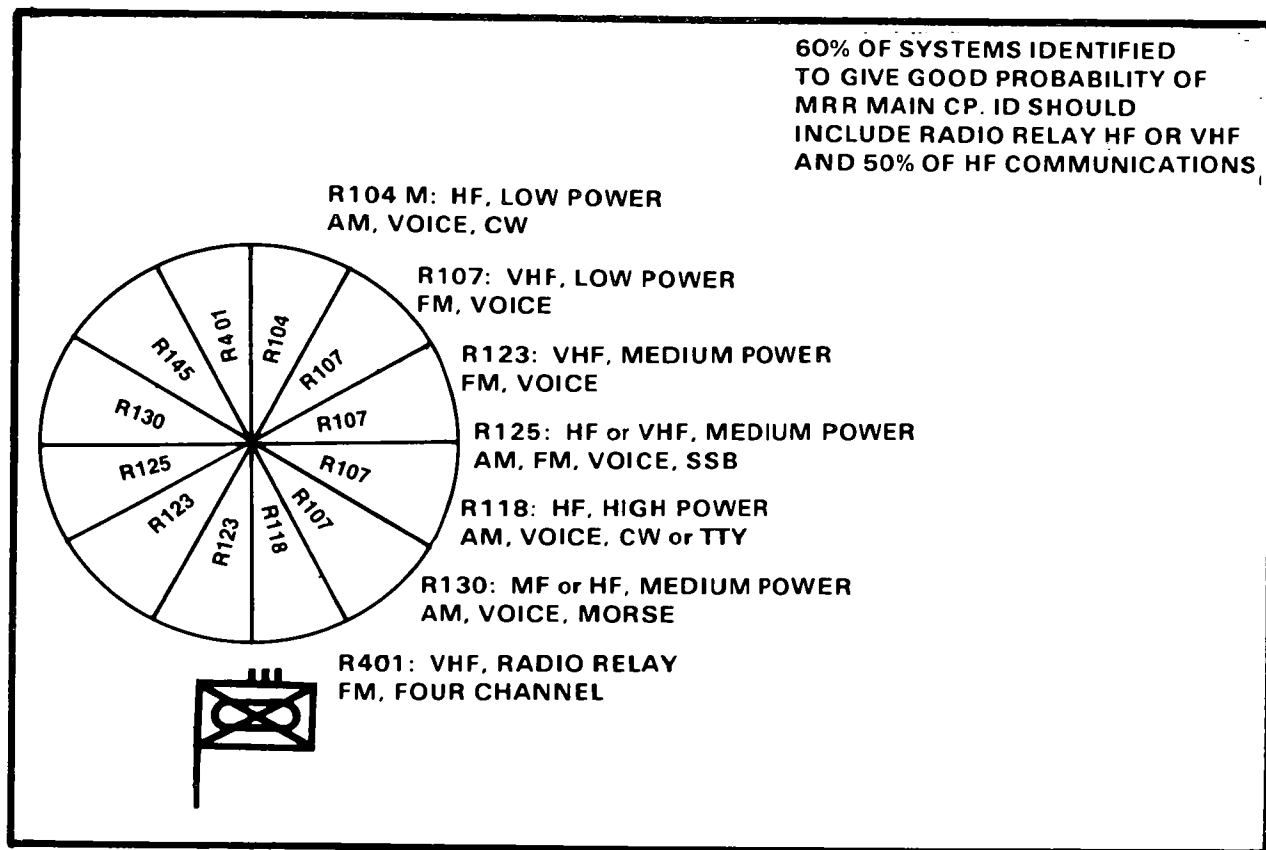


Figure F-3. Electronic node template: MRR.

or mobility corridor. They depict how enemy forces might deviate from doctrinal dispositions or adjust frontages, depths, or element spacing to account for the effects of weather and terrain. When considering the effects of the weather and terrain on the enemy's doctrinal EM signatures, deviations from doctrine are required to optimize the enemy's communication, target acquisition, fire control, electronic surveillance, and jamming capabilities, while providing the maximum protection from countering friendly systems.

The integration of SIGINT and EW information into situation templates focuses on the deployment of enemy target emitters for LOS within specific mobility corridors as enemy forces maneuver along an avenue of approach. It is a visual technique performed by the analysts of the EWS and TCAE, in which the doctrinal template is placed over the MC00 of an avenue of approach, to determine the best LOS from enemy emitters to friendly targets.

Enemy efforts to improve LOS for their own nets and their efforts to mask these nets from friendly intercept and jamming are also considered. Predicted locations of enemy units and their associated electronic emitters are moved to adjust LOS within a segment of a mobility corridor. Tactical options or likely alternatives available to the enemy must also be considered during situation templating in order to portray the enemy

commander's attempts to achieve a favorable balance of mass, speed, shock, and surprise.

Although the integration of SIGINT and EW information into situation templating focuses on electronic LOS, it must also consider other factors. For example, the most favorable LOS areas may offer the least concealment and cover; may be surrounded by natural or synthetic obstacles which restrict mobility; or may be situated to allow the rapid approach of friendly ground or air forces. Therefore, the analyst must consider where the enemy would most likely place assets to achieve the most effective electronic LOS consistent with asset or unit protection and mission requirements.

Electronic battlefield development of the situation template deals with both EM signatures and element placement. Weather and terrain ~~will~~ restrict the use of certain communications and noncommunications systems just as they affect asset placement. Thus, at certain times and locations on the battlefield, EM signatures change, deviating from what has been depicted on the doctrinal template and the electronic node template.

As friendly electronic collection systems begin to gather current information on the enemy's dispositions, movements, and electronic OB, this information is forwarded to the TCAE. The TCAE analyzes this raw data and compares it with the expected EM signatures and location data depicted on the situation, event, and electronic node templates. This comparison, which is also forwarded to the ASPS--

- Permits the TCAE to complete its analysis and provide analyzed SIGINT reports to the CM&D section for all-source integration by the ASPS.
- Assists the ASPS in revising the situation and event templates.
- Assists the EWS, TCAE, and ASPS in identifying enemy electronic emitters along with the associated weapons and equipment.
- Assists in locating enemy units by their electronic signature, and in identifying unit boundaries and HVTs.
- Assists the TCAE and EWS in locating and identifying enemy C³ nodes. An example of a situation template with electronic information applied is shown in Figure F-4.

Event Templates

The situation template is used to develop the event template. The integration of SIGINT and EW into event templating is the identification and analysis of significant battlefield events and enemy EM activities which provide indicators of the enemy courses of action as depicted on the event template. The analyst must distinguish between signals which have already been observed and those which are merely predicted. In addition,

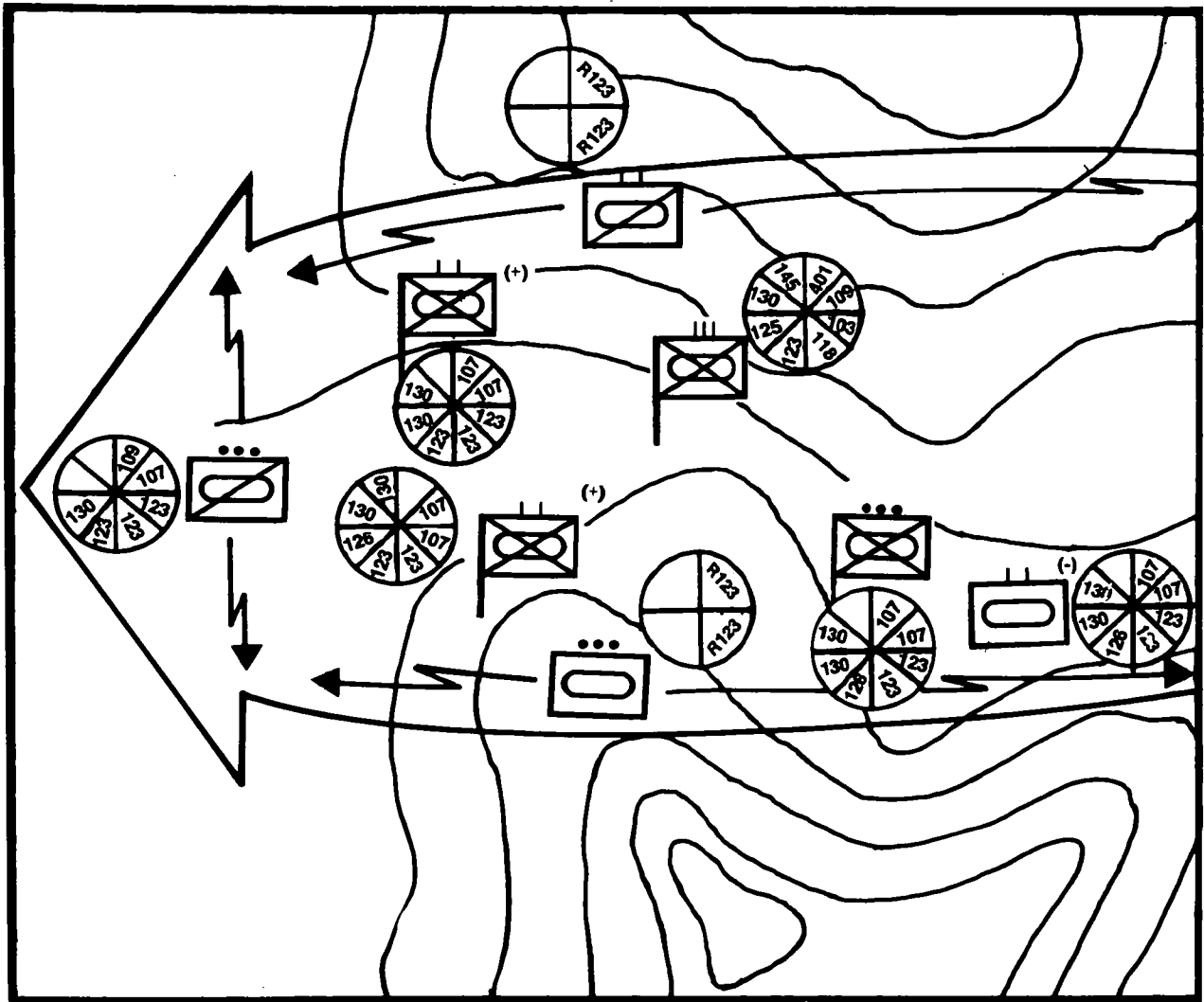


Figure F-4. Situation template: MRR.

enemy locations determined through other intelligence means may be plotted to orient the collection effort towards these units. Once hostilities begin, knowledge of when and where enemy activity is likely to occur on the battlefield will provide indicators of enemy intentions, or verify that projected events did or did not occur.

The situation template depicts potential enemy high value EM targets that friendly forces can exploit. As the enemy force moves along an avenue of approach or mobility corridor, identified enemy EM emissions may disclose C² nodes in critical areas. These areas are designated NAIs. NAIs are important to the friendly force commander because they are where significant battlefield events and activities will most probably occur and HPTs will most likely appear. NAIs are the basis of event templating as they provide direction and focus to intelligence collection and assist in the development of specific intelligence collection requirements.

SIGINT and EW NAIs are points or areas along an avenue of approach or mobility corridor where enemy EM emissions may confirm or deny a particular course of action. EM indicators occurring at NAIs within one avenue of approach or mobility corridor can be compared with indicators occurring at NAIs within other avenues of approach or mobility corridors to determine enemy intentions. The level of EM activity can also be a SIGINT and EW indicator of the existence of an NAI. The event template, developed by EW analysts during EPB, provides a means for analyzing the sequence and levels of enemy activities and events based on received EM emissions and for determining how these activities and events relate to each other. The event template is developed by wargaming each potential enemy course of action from a start point to the potential objectives. As EM events and activities occur, TPLs are used to track enemy movement within each avenue of approach and mobility corridor. An example of an event template with integrated SIGINT and EW NAIs is shown in Figure F-5.

Decision Support Templates

The DST is essentially a combined intelligence estimate and OPORD in graphic form. The DST integrates SIGINT and EW information to identify HPTs and SIGINT and EW targets; for example, enemy C²CM critical nodes. Electronic HPTs are identified and graphically depicted with other TAls as a result of the analysis of the event template and the overall IPB process.

SIGINT and EW analysts assigned to the ASPS and EWS of the DTOC support element integrate SIGINT and EW-based TAls into the decisionmaking process through war gaming techniques. The DST is developed by the ASPS to provide the commander with a clear understanding of the expected results if EW or destruction of enemy targets is selected. With this information, commanders are able to determine how to employ EW assets under their control effectively against the enemy. SIGINT and EW information is integrated into the DST to enable the G2 or S2 to quickly consider the enemy's adopted course of action, together with other indicators, and support the commander's decisionmaking process on friendly courses of action.

The DST depicts SIGINT and EW TAls, DPs, and TPLs along each avenue of approach where the commander may want to interdict enemy forces or to reduce enemy capabilities by fire, maneuver, or jamming. A TAI is a point or area, usually along an avenue of approach or mobility corridor, where interdiction of an enemy force by fire, maneuver, or EW means will reduce or deprive the enemy of a capability or cause the enemy to adopt or abandon a particular course of action.

TAls may or may not have been previously identified as NAIs. NAIs are used for collection management purposes only and are not depicted on the DST. Decisions as to the employment of EW assets may be made at each DP or TPL. The decision may be to delay, disrupt, or deceive the enemy or to change collection priorities. As with the employment of other assets, DPs for the employment of SIGINT and EW assets do not dictate decisions to

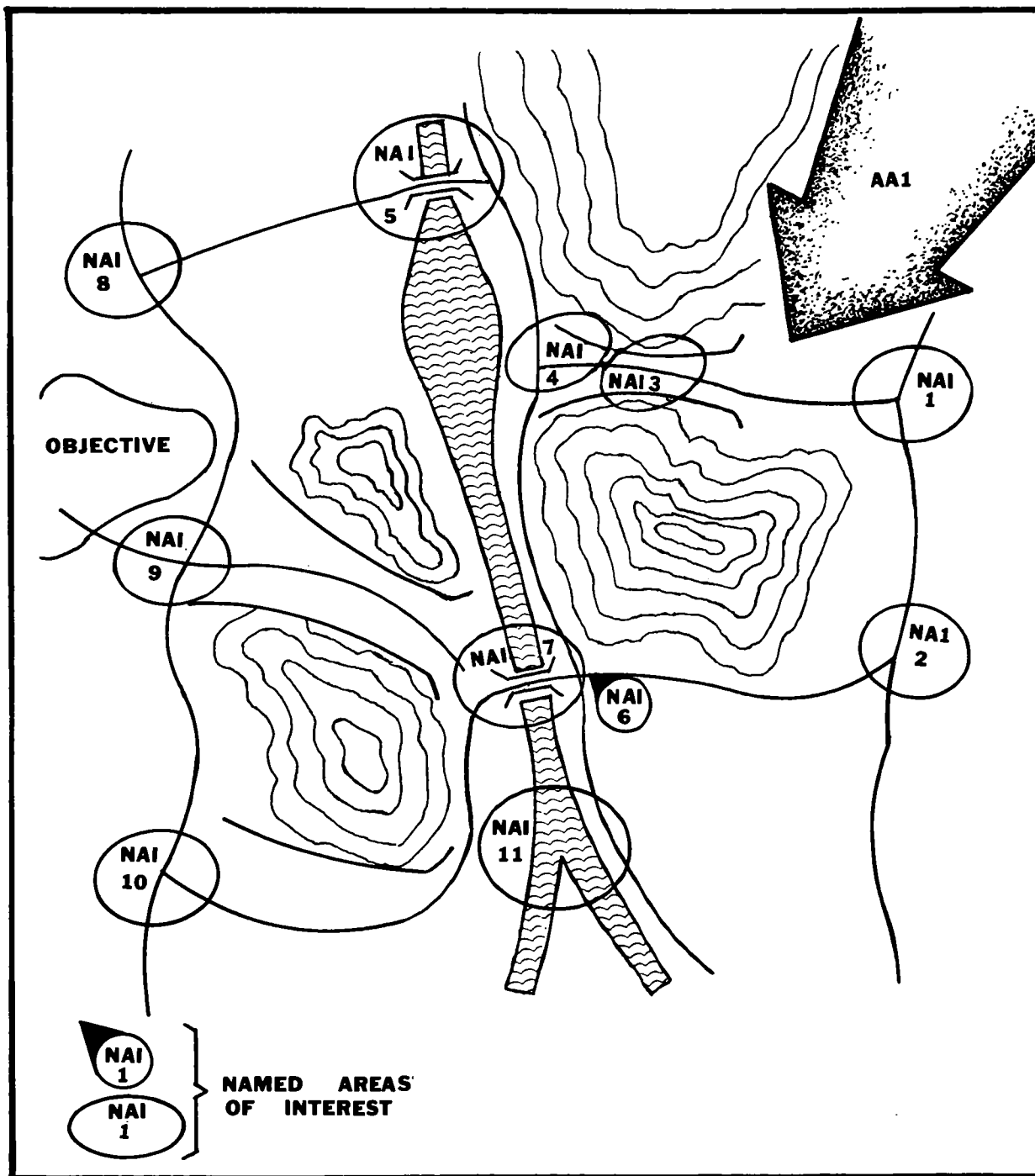


Figure F-5. Event template.

the commander, but identify points where a decision may be required. When an operations graphic is prepared and applied to the DST, the commander is provided with recommendations regarding operations which may be conducted to ensure that the enemy has to react to friendly actions, rather than the reverse. An example of a DST with EW and SIGINT TAI and DPs is shown in Figure F-6.

As the event template is used to develop the DST, and as both will normally be concerned with the same enemy systems, a single overlay depicting the critical nodes may be developed for use with both templates. This overlay will normally depict the critical nodes that can be expected to be encountered at each NAI or TAI on the event and DST, respectively. Figure F-7 is an example of a critical node overlay for use with the depicted event and DSTs.

CONCLUSION

EPB is not a separate function from IPB. It is an integral part of IPB which provides critical supporting data to the G2 or S2 and the commander. Done properly, it also maximizes the employment of friendly SIGINT and EW assets, by providing direction to the collection management effort, electronic node analysis, and decisionmaking functions, and provides a thorough understanding of the enemy's communications, noncommunications, electronic surveillance, and ECM capabilities.

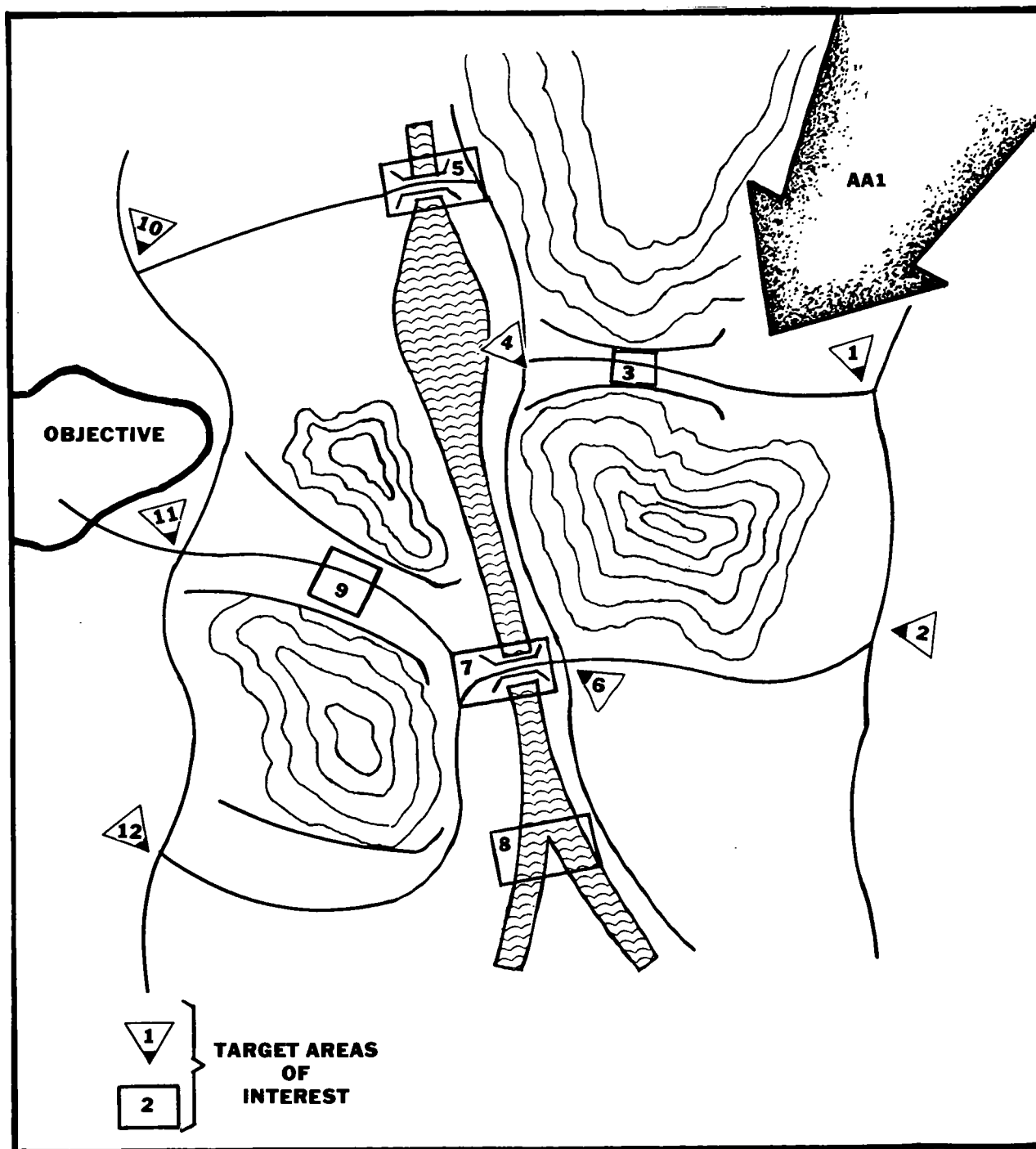


Figure F-6. DST with EW and SIGINT TAIs.

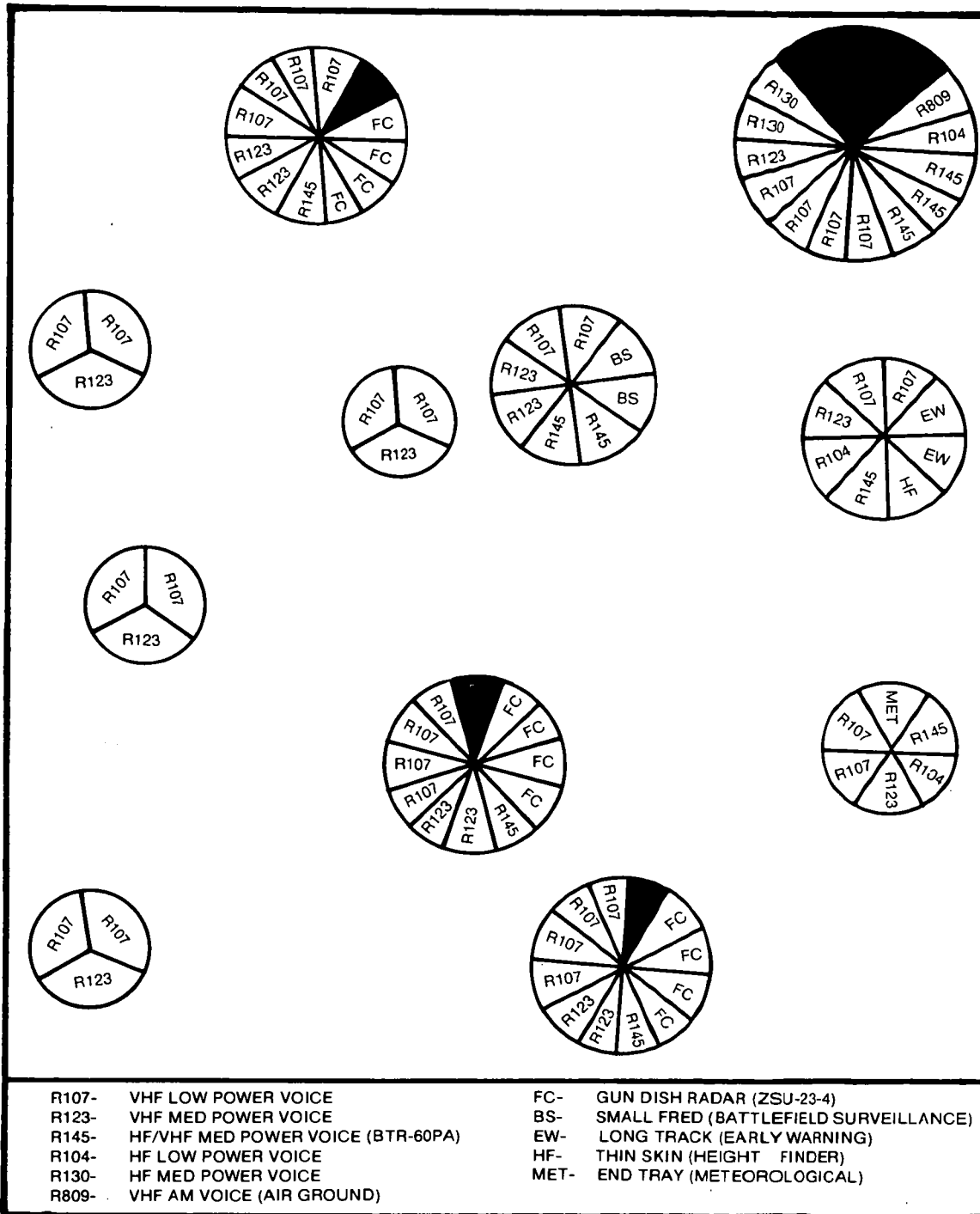


Figure F-7. Critical overlay for event and DST.



APPENDIX G

INTELLIGENCE PREPARATION OF THE BATTLEFIELD IN REAR OPERATIONS AND REAR AREA OPERATIONS

Rear area IPB is the process by which uncertainties regarding the rear area (rear operations) may be reduced. Although of slightly different focus than the traditional IPB process, the normal factors of BAE, terrain analysis, weather analysis, threat evaluation, and threat integration still apply.

IPB is conducted at all levels, and corps and division can be expected to include rear area IPB in the overall effort. However, as the G2 or G3 at these echelons will be concerned primarily with maneuver elements, the rear area IPB effort will be general in nature and will normally deal with events and situations which affect combat operations. Therefore, it becomes the critical responsibility of the rear area commander (whether the division support command (DISCOM) or corps support command (COSCOM) commander, G4 or S4, senior service support battalion commander or military police unit commander), to expand IPB for a particular specialty area.

The focus of the IPB effort in the rear area, like the IPB effort directed forward, will be concerned with determining the potential effects of enemy capabilities and weather and terrain on our own capabilities. However, the specific focus may be directed toward the enemy air threat, the threat from enemy air mobile or air assault operations, the SOF threat, the CI threat (for example, agents, sabotage, or espionage), and the guerilla force threat. Terrain and weather considerations will focus on--

- Major supply routes.
- LOC.
- The placement of supply communications and maintenance facilities.
- Location of nuclear weapons depots.
- PW compounds.
- Civilian internee cantonments.

Additional considerations may include--

- The potential for civil disorder in the area.
- Identification of areas with heavy concentrations of individuals who may be sympathetic to the enemy cause.
- Identification of areas where the Allied cause is held in high favor.

- Locations of groups and individuals who may be antagonistic to both sides.
- The movement of refugees through the area and the potential for unwanted civilian assistance.

As with tactical IPB, the G2 or S2 serves as the IPB coordinator and drives the IPB process to ensure that PIRs are answered according to the commander's guidance. However, rear area IPB involves a coordination effort that goes beyond the forward area effort. During the rear area IPB process, the G2 or S2 needs to coordinate with--

- G3 or G4.
- Transportation officer
- Maintenance officer.
- Chemical officer.
- Medical officer.
- Civil affairs officer.
- PSYOP personnel.
- Military police.
- CI units.
- The engineer officer.
- The air defense officer.
- The air liaison officer.

Each of these players will provide the G2 or S2 with specific information or requirements that will require consideration during IPB.

BATTLEFIELD AREA EVALUATION

As with the forward battle, BAE involves assessing the overall nature of the enemy and the operating environment. The evaluation of the rear area focuses on significant areas and features that must be considered during the IPB process. The terrain and weather are evaluated to determine their effect on operations. Enemy forces that may operate within the rear area are also evaluated to determine their capabilities relative to the terrain, weather, and friendly mission. However, in addition to the normal evaluation process, the rear area analysis must also include an analysis of the civil-military situation within the area. This evaluation includes but is not limited to the civil attitude toward the friendly mission and the enemy forces, refugee movement, and the

potential for agent operations and civil disorder. In other words, the analyst must add a careful evaluation of rear area population, security, PSYOP, and civil affairs functions to the analysis to complete rear area IPB.

As with the forward battle the rear area consists of the AO and AI, which are viewed in terms of width, depth, height, and time.

The rear AO is where the DISCOM or COSCOM or other rear area commander has been granted the authority to conduct operations. However, unlike the forward area, the rear area will probably include a geographical area where several commanders are conducting operations simultaneously. Situations may exist where elements of higher and lower support echelons are operating or located in the same area. Planning considerations for the rear area include not only the conduct of CSS operations but also the additional considerations brought about by the extremely large area involved. The AO for the rear area is similar to that of the forward area, except the area is generally larger. Potential targets for rotary-wing aircraft, air assault troops, and SPETSNAZ units become critical in rear AO.

Like the forward AI, the rear AI is based on METT-T and the commander's concept of the operation. Unlike the forward area, the rear AI extends into enemy territory only during the offense when support units must be prepared to move into regions formerly occupied by the enemy. The G2 recommends the AIs to the commander, or the commander will determine the AI, based on known logistics requirements. The rear AI may include areas as large as a theater rear, or even an entire COMMZ. As with the rear AO, the rear AI may overlap other rear area commanders' AIs as well as those commanders' AOs. The rear air AI is extremely large due to the rapid effect that enemy aircraft can have on combat support and service support operations and on rear area security.

TERRAIN ANALYSIS

Terrain analysis examines the effects of terrain on rear area combat support, CSS, and security operations in an effort to reduce uncertainties in these areas.

The DISCOM, COSCOM, G2, S2, or rear area commander receives terrain analysis support from the division or corps terrain teams in direct support of their respective headquarters. Rear area IPB planners may have a certain advantage in coordinating with the terrain teams, in that the teams are normally located within the rear area commander's AO. This potential for better coordination does not relieve the rear area IPB coordinator from understanding terrain analysis and from determining terrain information requirements based on specific rear operations requirements. In the event that terrain teams are not available to support the rear operations effort, the terrain analysis task falls to organic personnel. Thus, intelligence personnel at DISCOM or COSCOM, with other support and security units, must be familiar with terrain analysis fundamentals and must practice their application to the IPB process.

The rear area terrain analyst or IPB coordinator is concerned with the same factors and relies on the same DMA-produced data bases and terrain factor overlays as the forward area IPB coordinator. However, the focus of the military aspects of the terrain is on the movement, control, and security of vulnerable support assets rather than on combat operations.

Observation and Foff must be considered because rear area air defense assets require LOS to effectively protect the rear operations area. Agents and SPETSNAZ personnel must acquire their targets visually. Airborne and air assault troops require visual approach to their targets or LZs. Foff remain important for rear area defense, security, and the protection of critical assets.

As with the forward battle, concealment and cover in rear operations are critical. The IPB analyst must consider concealment available to provide rear area elements protection from enemy air and ground observation. The IPB analyst must also consider the concealment available to enemy forces which may be operating in the rear operations area, enemy agents, and guerilla operations. As with the forward battle, concealment is critical to operations security, CI, and deception operations. Cover is considered in terms of protection from enemy long-range weapons that can range the rear operations area, as well as in terms of protection from direct fires from enemy elements or guerillas operating in the rear. Cover must also be considered in terms of its effect on the friendly security mission.

Obstacles are analyzed primarily for their effect on rapid entry or exit to the rear area as well as for their potential to effect the rear area support mission. Obstacles are also considered for their effect on the placement of elements within the rear operations area. As with all obstacle analyses, the effect of weather on trafficability is a primary consideration.

Key terrain in the rear area is considered based on its ability to increase or decrease our combat support capability. For example, the availability of a water supply for a chemical decontamination point may make a certain location key terrain. Key terrain is also critical to the rear area security mission, and may include potential DZ or LZs, communication sites, and depot sites within the area. Civil-military or PSYOP considerations may also affect or determine what is or is not key terrain. Therefore, built-up areas, refugee evacuation routes, or areas where the population is sympathetic to the friendly or enemy cause may be considered key terrain. As with all key terrain analysis, what is and is not considered key terrain depends on the rear area mission, the echelon, the enemy, and the situation.

The analysis of the air and ground avenues of approach into the rear area is critical to terrain analysis. It is especially critical for the analyst to be aware of the air avenues of approach into the rear area in the face of the growing air and air assault threat. Ground avenues of approach should be analyzed with respect to their capability to support rapid movement of support elements into the rear area and those elements

in support of combat operations. The potential movement of enemy forces into the rear area should also be of prime concern, as should potential mobility corridors that could be used by aurally inserted or irregular forces.

WEATHER ANALYSIS

The same general considerations and overlays which are employed in IPB of the forward area apply to the rear. The effects of weather on observation, FofF, camouflage, concealment, radio and radar equipment, LOS operations, morale, and equipment operations still must be considered. The effect of weather on fixed- and rotary-wing aircraft operations is considered critical to the rear area IPB effort, as are determining the exact conditions of visibility and illumination which will support agent, SPETSNAZ, or guerilla operations.

Knowledge of the effects of weather on mobility and soil stability is critical to rear operations. Mobility is critical to the continued movement of support elements, refugees, and PWs through the rear area as well as to the ability of agents and SPETSNAZ forces to operate. Soil stability is especially critical to rear operations due to the requirement to provide semipermanent positions for support elements. For example, an area which appears fairly stable might provide an excellent site for a POL supply point. However, this same area may become an impossible quagmire after minimal precipitation due to the extremely heavy traffic associated with a POL facility.

Other weather considerations for rear operations include--

- Agents, SPETSNAZ, and air assault forces that rely heavily on bad weather, limited visibility, and darkness to mask their operations. These conditions hinder the effectiveness of friendly observation, direct fire, and physical security.
- Rear area civil affairs, PSYOP, refugee movement operations, and PW movement operations that are normally degraded by adverse weather.
- The potential for civil disorder that increases as the weather improves. Groups or individuals sympathetic to the enemy will normally attempt to create disorderly situations when people are out and active.

THREAT EVALUATION

As with forward operations, threat evaluation for rear operations and rear area operations consists of a detailed study of the enemy forces, including their organization, tactical doctrine, weapons, and supporting systems. These forces are evaluated to determine their capability to operate effectively in the rear area environment. Threat evaluation also includes an examination of potential HVTs in the rear area, threat doctrine for determining airborne DZs and helicopter LZs, and SPETSNAZ

team employment. This information will be reevaluated during the threat integration phase to determine the constraints imposed on doctrine by the terrain and weather in the rear area.

Rear area threat evaluation is a continuing process. As the threat to the rear operations area increases, the threat data base must change to reflect current doctrine. Among these developing doctrines, the threat development of air assault, special purpose forces, and OMG concepts are critical.

Rear area threat evaluation will result in a limited type of doctrinal template which focuses on the enemy's air assault, airborne, and SPETSNAZ employment doctrine. Like other doctrinal templates, these convert enemy OB data into a graphic display depicting how the enemy would employ these forces if not constricted by weather and terrain. As with other doctrinal templates, they provide a basis for situation and target development.

Except for large-scale aerial bombing operations, doctrinal templates for enemy rear area aviation operations have little meaning. Instead, friendly air defense assets should be apprised of likely enemy air avenues of approach, attack profiles, and attack altitudes of various aircraft.

As with LIC, doctrinal templates showing enemy guerilla operations, agent threat, and civil-military potential threat areas are not prepared as they would have no value. However, it is during the threat evaluation function that a rear area guerilla operations SITMAP and a rear area population status overlay are prepared. Figure G-1 is an example of a doctrinal template for airborne and aviation operations.

The unconventional warfare SITMAP for the rear area includes guerilla operating areas, probable headquarters and encampment areas, and movement routes. If the guerilla threat in the rear operations area is determined to be negligible, the SITMAP will include only information for agent and SPETSNAZ small detachment operations. Figure G-2 is an example of an unconventional warfare SITMAP.

The population status overlay shows areas where high concentrations of groups or individuals sympathetic to the enemy cause might be located; areas where a high potential for civil disorder exists; and areas where PSYOP and civil affairs activities would be most and least effective. The overlay should be prepared only after a thorough study of the military-political climate in the area and of the economic and social factors affecting the attitudes of the civil population. Figure G-3 shows an example of a population status overlay.

THREAT INTEGRATION

As with threat integration in forward operations IPB, threat integration for rear operations or rear area operations relates enemy doctrine to the terrain and weather to determine how the enemy might actually fight within the rear area. Threat integration for rear operations or rear area operations uses the same situation, event, and

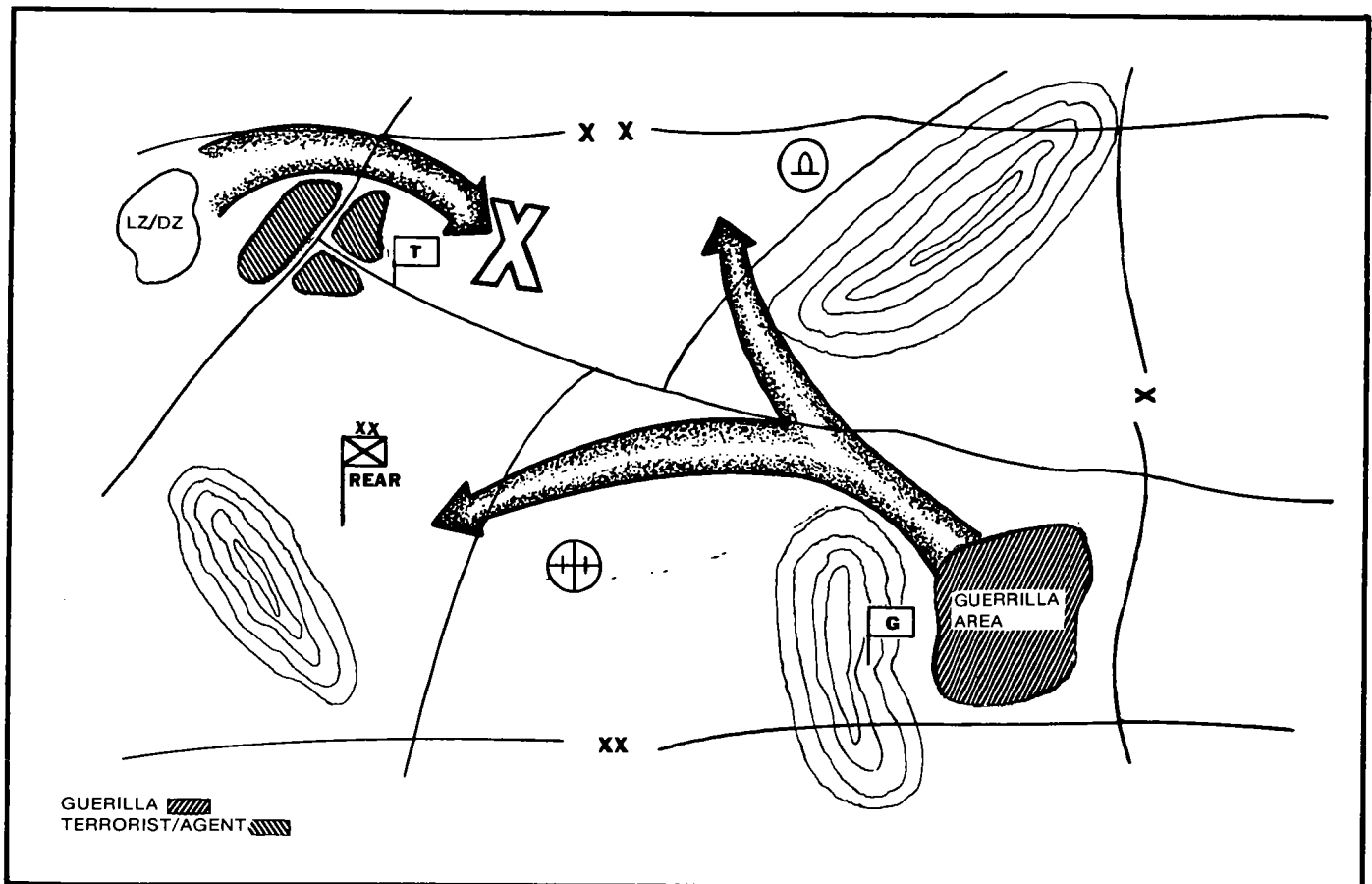


Figure G-2. Unconventional warfare SITMAP.

events which provide indicators of the enemy course of action. Knowledge of the specific rear area threat and where and when the enemy activity is likely to occur during rear operations and rear area operations provides indicators of enemy intentions.

Just as with forward operations, as the enemy attempts to adopt a particular course of action within the rear area, critical areas become apparent, and targets appear. These are designated as rear area NAIs. Unlike the forward operations, the NAIs for rear operations normally do not focus on mobility corridors, but on the specific sequence of events that would indicate that the enemy was preparing to, or employing air, airborne, air assault, special purpose, agent, or guerilla forces. The event template also considers probable enemy courses of action such as the creation of civil disorder or general popular uprising and the potential for refugees or PW movement to effect friendly operations.

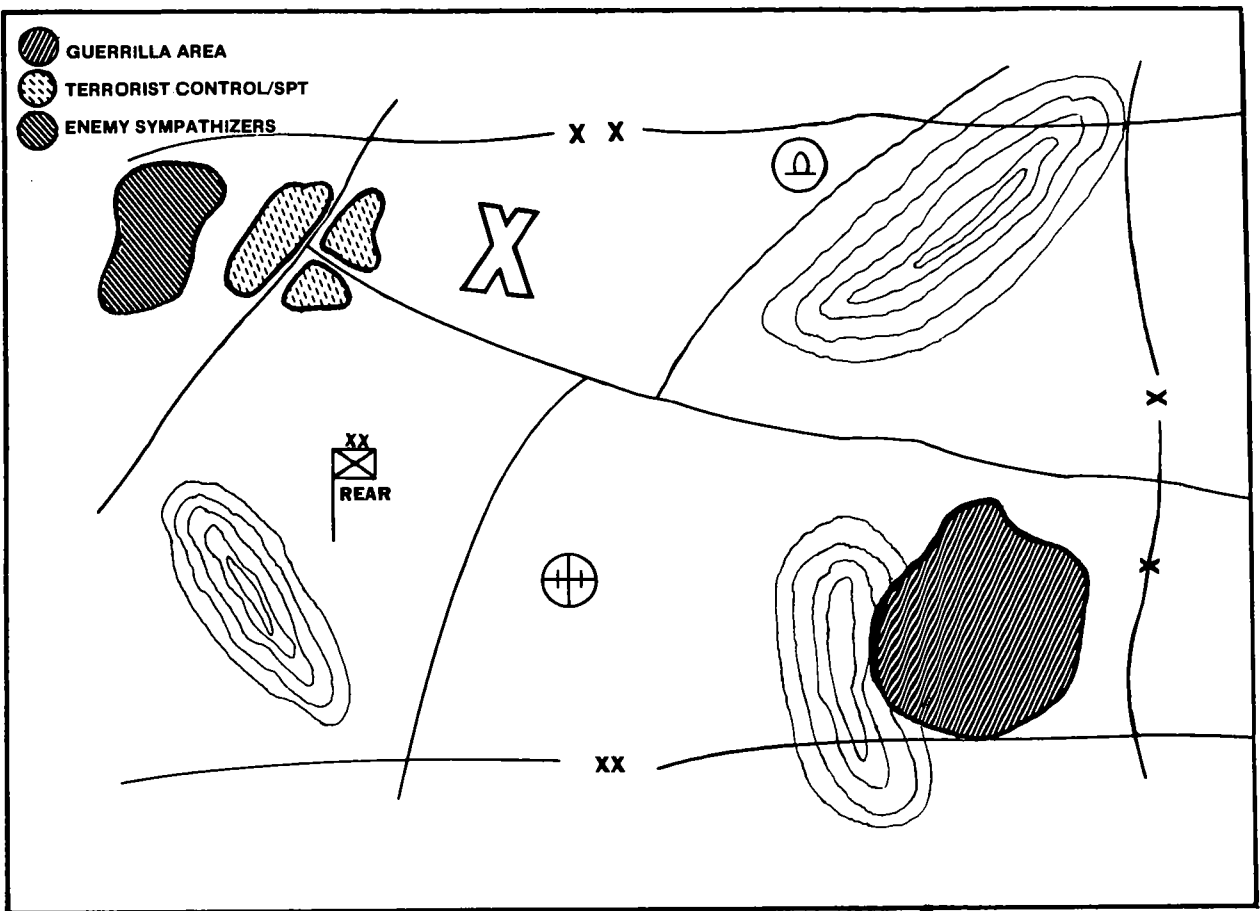


Figure G-3. Population status overlay.

This is not to say that mobility corridors are ignored during rear operations event templating. Mobility corridors leading from LZs and DZs, which were identified during situation and potential small unit and guerilla movement routes templating, are targeted and NAIs are established. These assist in teaching the enemy and assist the collection manager in directing collection assets. Rear area NAIs also assist the commander responsible for security and CI personnel in determining specific security and denial operation requirements. Potential enemy maneuver unit mobility corridors into the rear area are also considered during event templating and NAIs are established along these routes.

These NAIs become active only if the enemy conducts deep penetrations or manages to break through forward friendly maneuver. Although the rear operations commander has limited resources to counter such enemy operations, the presence of NAIs along potential mobility corridors into the rear serves to alert the commander to probable enemy intentions in time to relocate or concentrate available assets to protect critical facilities.

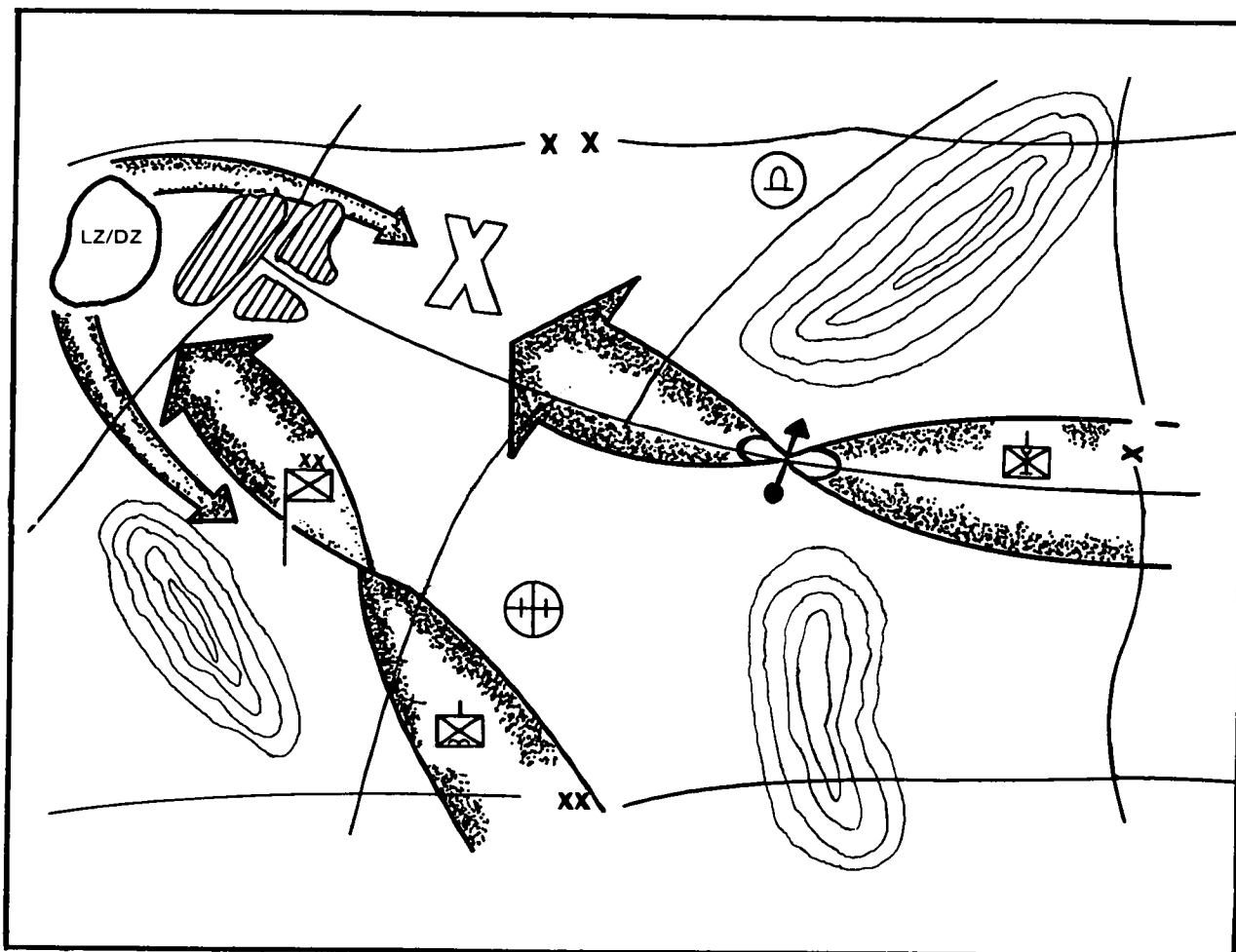


Figure G-4. Situation template (air and ground access).

The use of TPLs during event templating has only limited application during rear operations or rear area operations IPB. TPLs can be employed to track airborne and air assault forces as they move from the LZs and DZs to their objectives. However, this is often difficult due to the short distances involved. Example: Soviet doctrine calls for company-sized and smaller unit DZs and LZs to be 5 kilometers or less from the objective, although larger unit or multiple drops may call for assembly areas up to 10 kilometers from the objective. If time phasing is employed in tracking company-sized or larger airborne and air assault forces, a 1-hour consolidation period on the DZ and LZ should be assumed. Figure G-5 is an example of an event template for airborne and air attack options.

TPLs also are used in conjunction with potential enemy deep penetration or exploitation operations into the rear area. When attempting to track enemy OMG or exploitation forces entering the rear operations area, maximum doctrinal rates of movement should be assumed, as such elements would be avoiding contact until reaching their objectives. Figure G-6 is an example of an event template for OMG operations.

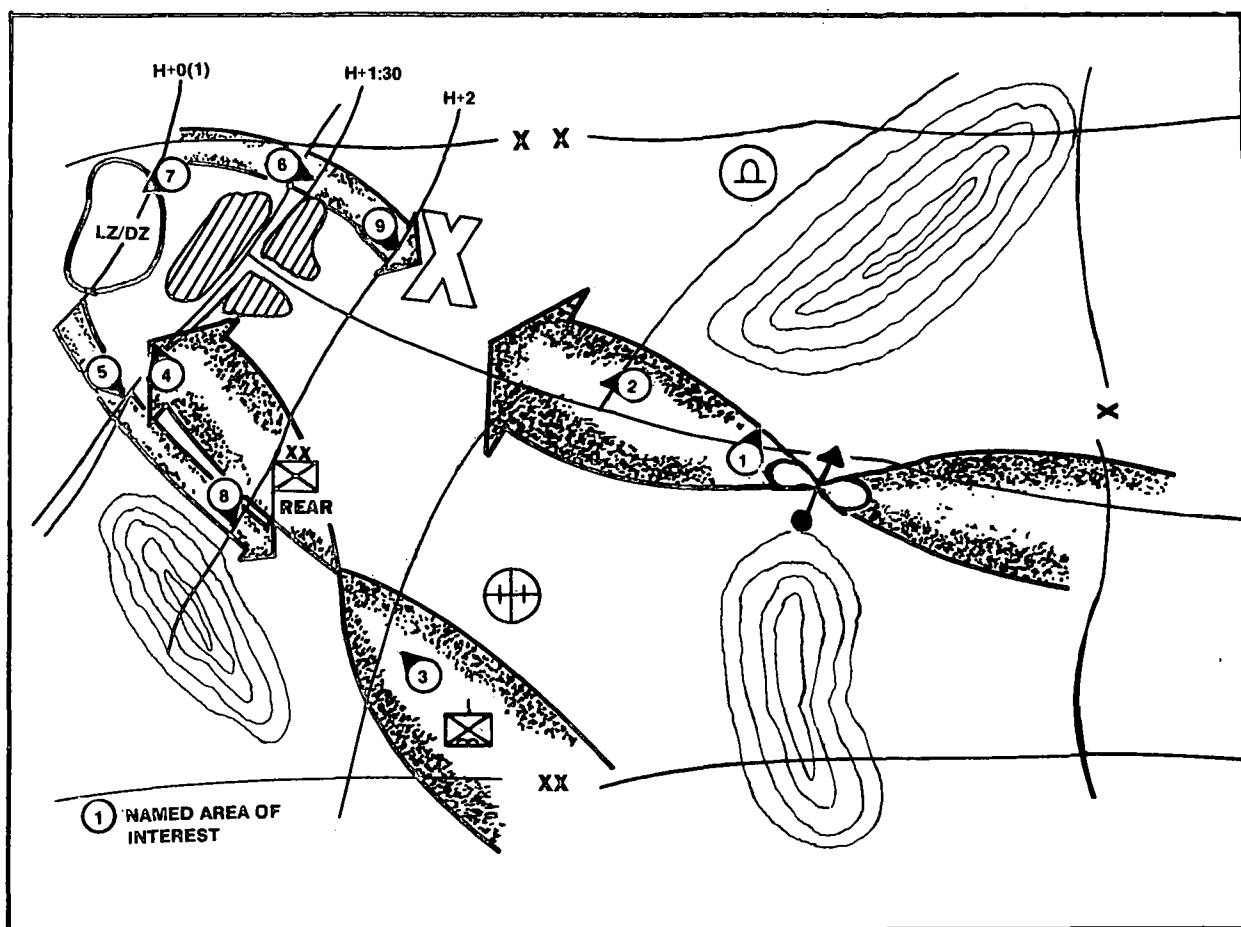


Figure G-5. Event template (airborne and air attack options).

Rear operations and rear area operations event analysis matrix supports the event template and is used in conjunction with the unconventional warfare SITMAP (Figure G-2) and the population status overlay (Figure G-3). Together, these figures illustrate probable enemy courses of action during the rear operations and enhance the direction of the rear operations commander's limited security, CI, and collection assets.

Rear operations and rear area operations DST is based on the event template and assists the rear operations commander in identifying critical events and threat activities which may require decisions. The DST does not make decisions for the commander. Rather, it provides a structure for reducing rear operations uncertainties. Rear operations and rear area operations DST are especially critical because they serve as an invaluable tools in coordinating the placement of support elements and the many activities within the rear area.

Through rear operations and rear area operations event templating the commander identifies areas where significant enemy activity or events will probably occur. Guerilla activities, agent, SPETSNAZ, and civil-military problem areas will be identified through the unconventional warfare

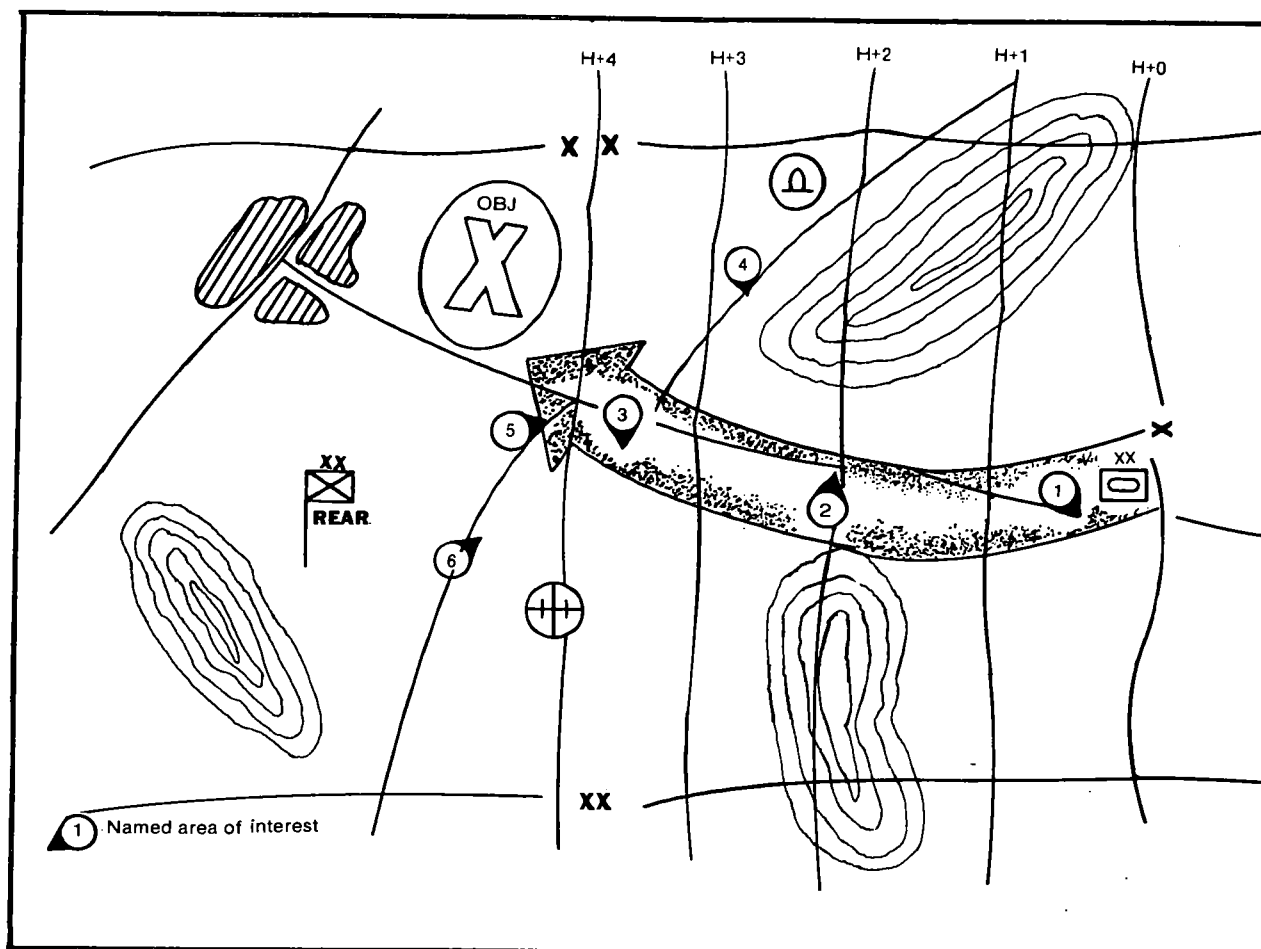


Figure G-6. Event template (OMG operations).

SITMAPs and population status overlays, in conjunction with the event analysis matrix. Decision support templating identifies those areas where rear commanders can deploy air defense, security, and CI assets where they can influence the effect of the threat on rear operations. Decision support templating also identifies those areas where rear commanders can place their support elements with the greatest degree of security consistent with mission accomplishment.

As rear operations commanders normally are not as concerned with fire and maneuver as their forward counterparts, rear area operations focus on TAls which are oriented more toward security and CI. Areas previously identified as NAls during event templating or on the unconventional warfare SITMAP or population status overlay are identified as TAls. These will include both specific points along mobility corridors and specific sequences of events that point to the enemy's adoption of other actions that could disrupt rear area operations.

As with the forward battle, TAls are areas where the commander can delay, disrupt, destroy, or manipulate the threat in an effort to cause

the enemy to abandon a particular course of action. Rear operations commanders have a very limited number of maneuver elements at their command against identified TAIs. These include defensive posturing of rear area units, effective placement of elements, aggressive employment of security units, an active CI effort and the expedient use of civil affairs and PSYOP assets. Sample rear operations or rear area operations TAIs include--

- LZs and DZs.
- Road junctions.
- Forest paths and trails.
- Small groups of individuals (especially in civilian clothes) attempting to move through or evade detection in rear area.
- Areas with groups or individuals sympathetic to the enemy cause.
- Guerilla encampments of headquarters areas.

TAIs also are assessed for enemy high-speed mobility corridors into the rear area. Although these TAIs are assessed, rear operations commanders normally will not have the assets to do more than delay any large-scale penetration of the area. Therefore, commanders are forced to rely on assets outside their control, the defensive deployment of combat and CSS elements and their ability to move vulnerable units rapidly to dissuade the enemy from their course of action.

Following the selection of TAIs, DPs are identified. However, due to the focus of rear operations, these DPs are oriented toward the requirement to employ air defense, security, CI, PSYOP, or civil affairs assets or to relocate critical units or facilities in the face of the threat. As with forward battle DPs, they must be placed to allow sufficient time for the required decisions to be made. Rear operations and rear area operations DPs equate time to the battlefield and preserve commanders' options by alerting them to specific events which require the employment of assets or other decisions.

Rear operations and rear area operations DSTs depict TAIs, DPs, enemy objectives, and friendly HVTs (nuclear depots, and missile sites). Mobility corridors and TPLs are included if applicable. The DST is supplemented by the unconventional warfare SITMAP and population status overlay. The current enemy situation is shown only if enemy forces are known to be operating within the rear area. The DST may be supplemented by a decision support matrix which relates each DP to the associated TAI requiring friendly action. Figure G-7 is an example of rear operations DST (level 3) airborne or air attack. For an example of division rear operations DST (level 3) OMG operations, refer to Figure 4-45.

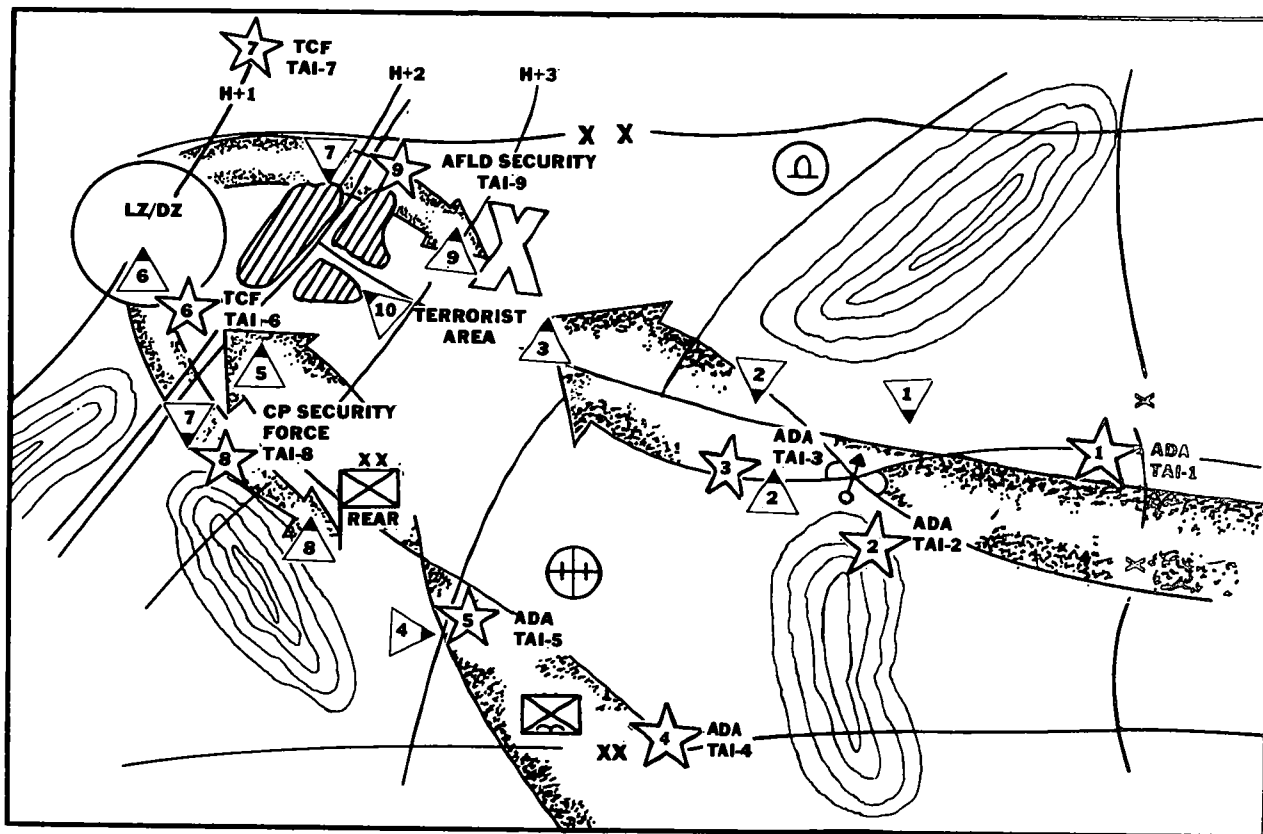


Figure G-7. Rear operations DST (level 3) airborne or air attack.

INTELLIGENCE PREPARATION OF THE BATTLEFIELD--THE VITAL PIECE

IPB is vital to rear operations commanders' conduct of operations and their phase in the total battle. It aids in the accurate comparison of friendly security and CI capabilities with potential enemy courses of action and assists them in making the proper decisions regarding unit placement and asset employment. IPB forces commanders to confront their own vulnerabilities and to depict enemy vulnerabilities and potential opportunities. Finally, IPB helps commanders determine when, where, and how to employ, dispose, and emplace rear area assets to ensure success.

GLOSSARY

AA	avenue of approach
AAA	antiaircraft artillery
ACR	armored cavalry regiment
ADA	air defense artillery
ADP	automatic data processing
afld	airfield
AGL	above ground level
AI	area of interest
ALSO	artillery limited surface observations
alt	altitude
AM	amplitude modulation
AO	area of operations
arty	artillery
ASPS	all-source production section
AT	antitank
ATC	air traffic control
AT-5	Soviet antitank guided missile
AT-8	Soviet antitank guided missile
ATGM	antitank guided missile
AVLB	armored vehicle launch brigade
avn	aviation
AWS	Air Weather Service
BAE	battlefield area evaluation
BAI	battlefield air interdiction
bde	brigade
BICC	battlefield intelligence coordination center
BMP	designation of a type of Soviet armored personnel carrier
BP	battle position
BTF	battalion task force
C	Celsius
C ²	command and control
C ³	command, control, and communications
C ³ CM	command, control, and communications countermeasures
C ³ I	command, control, communications, and intelligence
CAA	combined arms army
CAB	combat aviation brigade
CAME	Corps Airspace Management Element
CAS	close air support
cav	cavalry
cbt	combat
CBU	cluster bomb unit
CCM	cross-country movement
cdr	commander

CENTAG	Central Army Group
CENTCOM	United States Central Command
CFA	covering force area
chem	chemical
CI	counterintelligence
CIG	ceiling or height above ground level to base of clouds
CINC	Commander in Chief
clr	clear
cm	counter mobility
CM&D	collection management and dissemination
co	company
COIN	counterinsurgency
coll	collection
COMINT	communications intelligence
comm	communications
COMMZ	communications zone
con	control
CONUS	continental United States
COSCOM	corps support command
CP	command post
CS	combat support
CSS	combat service support
CTOC	corps tactical operations center
CW	continuous wave

DAG	division artillery group
decon	decontamination
def	defense
DISCOM	division support command
div	division
DMA	Defense Mapping Agency
DP	decision point
DS	direct support
DST	decision support template
DTOC	division tactical operations center
DZ	drop zone

E	east
EAC	echelons above corps
EACIC	echelon above corps intelligence center
ECB	echelons corps and below
ECM	electronic countermeasure
ECCM	electronic counter-countermeasures
ELINT	electronic intelligence
elm	element
EM	electromagnetic
enr	engineer
EPB	electronic preparation of the battlefield

ESM	electronic warfare support measures
est	estimated
EW	electronic warfare
EWR	early warning radar
EWS	electronic warfare section

F	Fahrenheit
FAC	forward air controller
FAIO	field artillery intelligence officer
FALOP	forward area limited observation program
FARP	forward area refueling and rearming point
FASCAM	family of artillery scatterable mines
FEBA	forward edge of the battlefield area
FID	Foreign Internal Defense
FLOT	forward line of own troops
FM	frequency modulation
FofF	fields of fire
FOFA	Follow-On Forces Attack
FRG	Federal Republic of Germany
FS	fire support
FSCoord	fire support coordinator
FSE	fire support element
FSO	fire support officer
FWD	forward

G2	Assistant Chief of Staff, G2 (Intelligence)
G3	Assistant Chief of Staff, G3 (Operations and Plans)
G4	Assistant Chief of Staff, G4 (Logistics)
GCA	ground-controlled approach
GCI	ground-controlled intercept
GRU	Main Intelligence Directorate of the General Staff (USSR)
GS	general support

HALO	high altitude low opening
HE	high explosive
helos	helicopters
HF	high frequency
HI-HI-LO	high-high-low
HIP	Soviet transport and attack helicopter
HN	host nation
HPT	high payoff targets
hr	hour
HVT	high value target

ID	identification
IEW	intelligence and electronic warfare
IFR	instrument flight rules
inf	infantry
IPB	intelligence preparation of the battlefield
IR	information requirements
ITB	independent tank battalion

J2	joint intelligence directorate
JAM	jamming
JOG	Joint Operations Graphic
JOG-A	Joint Operations Graphic (Air)
JOG-G	Joint Operations Graphic (Ground)
JOG-R	Joint Operations Graphic (Radar)
JOPS	Joint Operations Planning System
JSCP	Joint Strategic Capabilities Plan
JSEAD	joint suppression of enemy air defense
JTF	joint task force

kg	kilogram
KGB	Committee for State Security (USSR)
km	kilometer
km/h	kilometer per hour
LANTCOM	United States Atlantic Command
LC	line of contact
LD	line of departure
LIC	low-intensity conflict
LOC	lines of communication
LO-LO-HI	low-low-high
LOS	line of sight
LP	listening post
lt	light
LZ	landing zone

m	meters
MAC-V	Military Airlift Command-Vietnam
MASINT	measurement and signature intelligence
max	maximum
Mi-24	Soviet attack and/or transport helicopter (HIND)
MiG-27	Soviet fighter or fighter bomber (FLOGGER)
MBA	main battle area
MC	mobility corridor
MC-130	US aircraft
MC00	modified combined obstacle overlay
METT-T	mission, enemy, terrain, troops and time available
MF	medium frequency

MFF	minimum freefall
MG	machine gun
mi	mile
MI	military intelligence
min	minute
MM	millimeter
MO	modus operandi (method of operation)
MOB	main operating base
MOPP	mission-oriented protection posture
MRB	motorized rifle battalion
MRC	motorized rifle company
MRD	motorized rifle division
MRP	motorized rifle platoon
MRR	motorized rifle regiment
MSR	main supply route
MT	metric tons
mtn	mountain

N	north
NAI	named area of interest
NBC	nuclear, biological, and chemical
NCA	National Command Authority
NET	not earlier than
NLT	no later than
NOE	nap-of-the-earth
NORTHAG	Northern Army Group
NSDD	National Security Decision Directive

OB	order of battle
obj	objective
obs	obstacle
OCOKA	observation and fields of fire, concealment and cover, obstacles, key terrain, and avenues of approach and mobility corridors
OMG	operational maneuver group
OP	observation post
OPORD	operations order
OPSEC	operations security

PACOM	Pacific Command
PGM	precision-guided munitions
PIR	priority intelligence requirement
PIREP	pilot report
POMCUS	prepositioning of oversea materiel configured to unit sets
PSYOP	psychological operations
PL	phase line

PVS-5	night vision goggles
PW	prisoner of war
PTADP	Planning Terrain Analysis Data Base

RA	rear area
RAG	regimental artillery group
RAM	reliability, availability, and maintainability
RARP	rear area refueling and rearming point
R&S	reconnaissance and surveillance
rd	road
REC	radio electronic combat
recon	reconnaissance
regt	regiment
RH	relative humidity
RII	request for intelligence information
RPK	soviet light machine gun

S	survivability
S2	Intelligence Officer (United States Army)
S3	Operations and Training Officer (United States Army)
S4	Supply Officer (United States Army)
SA	security area
SA-8	Soviet surface-to-air missile (GECKO)
SAGGER	Soviet antitank guided missile (SAGGER)
SAM	surface-to-air missile
SBDP	Soviet Battlefield Development Plan
SCT	scattered
scty	security
sfc	surface
SHAPE	Supreme Headquarters Allied Powers Europe
SIGINT	signals intelligence
SITDEV	situation development
SITMAP	situation map
SLAR	side-looking airborne radar
SLOC	sea lines of communications
SOF	special operations forces
SP	self-propelled
SPAN	signals parametrics analysis of potential critical nodes
SPETSNAZ	KGB special purpose teams (not a US term)
SPG	Soviet 73 millimeter smooth bore gun
sqdn	squadron
SS-21	Soviet short-range surface-to-surface missile (SCARAB)
SSM	surface-to-surface missile
SWO	staff weather officer

T-64/72/80	Soviet tanks
TA	tank army
TAB	target acquisition battery
TAI	target area of interest
TARWI	target weather intelligence
TASC	training aids support center
TASM	tactical air-to-surface missiles
TBM	tactical ballistic missile
TCAE	technical control and analysis element
TCF	tactical combat force
temp	temperature
TPL	time-phase line
TTADB	Tactical Terrain Analysis Data Base
TTY	teletypewriter
TVA	target value analysis
TVD	theaters of military operations
US	United States
USAF	United States Air Force
USAFETAC	United States Air Force Environmental Technical Applications Center
USEUCOM	United States European Command
USSOUTHCOM	United States Southern Command
USSR	Union of Soviet Socialist Republics (Soviet Union)
VHF	very high frequency
VGK	Supreme High Command
vis	visibility
W	west
WETM	weather team
XING	crossing



References

REQUIRED PUBLICATIONS

Required publications are sources that users must read in order to understand or to comply with this publication.

Field Manuals (FMs)

101-5	Staff Organization and Operations
101-5-1	Operational Terms and Symbols

RELATED PUBLICATIONS

Related publications are sources of additional information. They are not required in order to understand this publication.

Field Manuals (FMs)

6-20	Fire Support in Combined Army Operations
11-50 (HTF)	Combat Communications Within the Division (How to Fight)
21-33	Terrain Analysis
30-10	Military Geographic Intelligence (Terrain)
34-1	Intelligence and Electronic Warfare Operations
34-3	Intelligence Analysis
34-10	Division Intelligence and Electronics Warfare Operations
34-60	Counterintelligence
34-80	Brigade and Battalion Intelligence and Electronic Warfare Operations
34-81/AFM 105-4	Weather Support for Army Tactical Operations
44-3	Air Defense Artillery Employment: Chaparral/ Vulcan/Stinger
44-30	Visual Aircraft Recognition
100-2-1	The Soviet Army Operations and Tactics

100-2-2 Soviet Army Specialized Warfare and Rear
Area Support

100-2-3 The Soviet Army Troops, Organization and Equipment

100-5 Operations

Training Circulars (TC)

100-20 Low Intensity Conflict

INDEX

actions
 mission, E-14

activities of operational significance, D-21

above ground level (AGL), C-4

aerial sensors, 4-13, A-4

AGL. See above ground level.

AI. See area of interest.

airborne, 5-2, C-18

air cavalry troop commander, C-5

aircraft, 4-5, 4-10, 5-2, C-16
 canalizes, C-18
 counterair (fighter), 4-23
 enemy, 4-5, 5-1 through 5-8, 8-1, C-18
 fixed-wing, 4-23, C-1
 rotary-wing, 1-1, 4-3, 4-10, 4-23, 4-26, C-1
 small-unit air insertion, C-18

air defense weapons, 5-2
 maximum effective ranges of, C-1
 wind speed and direction for, C-15

air assault, 3-1, 4-10, 4-26, 5-2, C-18

airborne, 3-1, 4-10, 4-26, 5-2, C-18

air cavalry troop commander, C-5

aircraft maximum service ceilings, minimum operating altitudes, C-1

aircraft movement, 4-10, C-19

air corridor, 4-26, 4-27

air defense early warning radar (EWR), 4-5

air insertion, B-9

air inversion layers, B-20

AirLand Battle, 1-1, A-1

air phase, C-34

air resupply possibilities, B-8
 airspace, 1-1, 4-3, 4-6, 4-26, 5-1, 5-2
 airspace medium, 4-61
 air traffic control (ATC), C-5
 Air Weather Service (AWS), 3-2
 allocation of combat power, 4-1
 all-source production section (ASPS), 3-2, 4-4, 5-5
 ALSO. See artillery limited surface observations.
 ambush sites, A-6
 analysis
 airspace, 4-6, 4-61
 basis for weather, 4-36
 climatology-based, 4-36
 contingency, A-1
 functions of terrain, 4-6
 key terrain in airspace, C-10
 LOS, F-2, 4-9, 4-23, 4-24
 offensive terrain, A-2
 operational level, 5-5, D-10
 terrain, 4-1, 4-6 through 4-8, 4-11, 4-13, 4-27, 5-1 through 5-3, 6-1,
 A-22, F-2, G-3 through G-5
 terrain masking, 5-2
 theater-based all-source intelligence, D-4
 weather, 4-1, 4-8, 4-23, 4-27, 4-32, 5-1 through 5-3, 5-6, A-22
 weather during airspace, C-13
 Annual Defense Authorization Act, D-4
 A0. See area of operations.
 A0 in urban warfare, B-6
 A0 times, 4-3
 area of interest (AI), 3-1, 4-1, 4-4, 4-5
 offensive, A-2
 offensive air, A-2
 rear, 5-1, G-3
 rear operations, 4-5, 5-1, 5-5

area of operations (AO), 1-1, 3-1, 3-2, 4-1, 4-3 through 4-15, 4-27, 5-2
air, 5-1, 5-2, 5-5, C-2
analysis of the, 4-15, 5-2
offensive air, A-2
rear, 4-4, 4-5, 4-12, 5-1, G-3

areas viewed in terms of width, depth, height (airspace), electro-optical,
and time, 4-3

artillery limited surface observations (ALSO), 4-37

ASPS. See all-source production section.

ATC. See air traffic control.

attack capabilities, 5-5

attack profiles, 5-2, C-34
obstacles and aircraft, C-9

avenues of approach, 4-9, 4-12, 4-13, 4-17, 4-20 through 23,
4-26 through 4-28, 4-30, 4-31, 5-1, B-16, B-18
additional variable considered in analyzing the air, C-10
air, 4-12, 4-23, 4-26, 4-27, 5-1, 5-2, 5-5
air and ground, 4-12, 4-13, 4-23, 4-27
airspace, 5-1, 5-2, C-10
analysis of the air and ground into the rear area, G-5
colors in which, 4-13
rear area, 4-13, 5-1, 5-5, C-5
MRB in the second echelon, or on a secondary, B-23
MRB on a main, B-23

AWS. See Air Weather Service.

axes of advance, 4-3, 4-13, 4-30, 4-31

battalion 3-1, 3-2, 4-3, 4-5, 4-6, 4-16, 4-27, 5-5
divisional reconnaissance, A-7
engineer topographic, 3-2, 4-16
MI, 5-5, F-1
motorized rifle (MRB), B-21

battalion task force (BTF), 4-28

battlefield air interdiction, 5-2, A-4

battlefield area evaluation for the urban battle, B-3

battlefield deception, 5-6

battlefield deception element, 3-2, 4-1

battlefield intelligence coordination center (BICC), 3-2

battle positions (BPs), A-15

BICC. See battlefield intelligence coordination center.

BPs. See battle positions.

brick yards, B-9

BTF. See battalion task force.

built-up areas, 4-17, 4-31, B-3, B-9

C². See command and control.

C³. See command, control, and communications.

C³CM. See command, control and communications countermeasures.

CAME. See Corps Airspace Management Element.

canalization of forces, B-13

canopy closure, 4-11, 4-15, 4-16

CAS. See close air support.

CCM. See cross-country movement.

centers of gravity, D-4

CI. See counterintelligence.

cisterns, B-9

civil affairs, 4-4, 5-1

civil disorder, B-1

civil-military concerns, 4-12

civil-military situation, G-3

civilian hospitals, B-7

clinics, B-8

CM&D. See collection management and dissemination.

close air support (CAS), 5-2, A-4
 rotary and fixed-wing, A-4

cover

- cloud, 4-19, 4-34, C-16
- concealment and, 4-9, 4-12, 4-30

collection management, 4-67

collection management and dissemination (CM&D), F-4

collection manager, 5-3, A-12

combat in built-up areas, B-1

combat service support (CSS), 3-1, 3-2, 4-5, 4-11, 5-3, 6-1

combat support, 3-1, 3-2, 4-5, 4-11, 5-3, 6-1

combat synchronization, 3-1

command and control (C²), 2-2

- air assisted, B-9

command, control and communications (C³), 4-10, 5-5

command, control and communications countermeasures (C³CM), 5-5, 5-6, 6-1

Commander in Chief (CINC), D-1

command estimate, 2-1, 5-3

command post (CP), 3-1

communications zone (COMMZ), 4-5

COMMZ. See communications zone.

control cycle, D-13

Corps Airspace Management Element (CAME), C-5

Corps Support Command (COSCOM), G-1

corps tactical operations center (CTOC), 4-6

corridor

- air operations, C-1
- air mobility, 4-9, 4-13
- counterattack avenues or, A-4
- mobility, 4-12, 4-13, 4-17 through 4-20, 4-23, 4-26, 4-27, 4-30, 4-31, 5-1
- mobility (air and ground), 4-9, 4-12

COSCOM. See Corps Support Command.
 counterattack options, A-1
 counterinsurgency--unique factors, E-1
 covering force, A-9
 CP. See command posts.
 critical enemy nodes and HVTs, 5-1
 critical friendly assets, A-23
 critical threshold value, 4-20, 4-39
 cross-country movement, 4-7, 4-19, C-16

 CSS. See combat service support.
 CTOC. See corps tactical operations center.
 DAME. See Division Airspace Management Element.
 darkness, C-14
 deception planners, 5-6
 decisionmaking, 5-2
 support of strategic and operational, D-3
 decisionmaking methodologies, D-12
 decision points (DPs), 4-69, F-11
 air operations, C-1
 decision support template (DST), 3-1, 3-2, 4-27, 4-66
 air, 4-74, 5-1, 5-2, 5-5
 development of the, 4-66
 enemy counterattack, A-20
 enemy defense, A-17
 enemy withdrawal, A-16
 friendly, 5-2, 5-3, 5-5, 5-6, 6-1, A-16
 friendly attack, A-20
 rear operations, 5-1, 5-5, G-13
 defense, 5-2, A-6
 hasty, A-6
 MRB, B-25
 MRB (BMP), 4-50
 objective of a, A-8

defense in the course of the offense, A-7

Defense Mapping Agency (DMA), 4-6 through 4-8, 4-13, 4-15, 4-16

defense-specific considerations, A-22

defensive battlefield area evaluation, A-20

defensive posture, A-1

demands, B-1

dense, random construction, B-3

directional antennas, 4-26

dispersed residential area, B-4

Division Airspace Management Element (DAME), C-5

division support commander (DISCOM), G-1

division tactical operations center (DTOC), F-1

DMA. See Defense Mapping Agency.

doctrinal rates of movement, 4-17, 4-63

doctrinal enemy movement rates, 4-63

doctrine

AirLand Battle, 1-1

Soviet, A-5

DOD Climatological Data Agency, 4-37

downwind attacks, A-5

drop zone (DZ), 4-3, 5-2

airborne, 5-2, C-6

DST. See decision support template.

DTOC. See division tactical operations center.

DZ. See drop zone.

dust plumes, A-22

EAC. See echelons above corps.

EAC technical control and analysis element (TCAE), 5-5

EACIC. See echelons above corps intelligence center.

ECB. See echelons corps and below.

echelons above corps, 3-2

echelons corps and below, F-1

echelons above corps intelligence center (EACIC), 3-2

ECM. See electronic countermeasure.

electrical jammers, 4-26

electronic battlefield development, F-9

electromagnetic (EM) events and activities, F-11

electronic battlefield surveillance, F-2

electronic countermeasure (ECM) (jamming), F-2

electronic dimension, F-7

electronic intelligence (ELINT), F-2

electronic nodes, F-4

electronic preparation of the battlefield, 5-5, F-1

electronic warfare (EW), 1-2, 3-1, 4-23, 4-26

electronic warfare section (EWS), F-1

element placement, F-9

elevated railways, B-8

ELINT. See electronic intelligence.

EM. See electromagnetic.

EM signatures, F-9

EM surges, F-3

enemy commander, D-12

enemy electronic warfare support measures (ESM), F-2

enemy objectives, 4-27, 4-30, 4-31

enemy specialized and high value assets, A-23

engineer terrain detachment, 3-2

ESM. See electronic warfare support measures.

evaluating enemy aircraft performance, C-18

EW. See electronic warfare.

EW elements, 1-2

EW tasking, 5-5

EW. See early warning radar.

EWS. See electronic warfare section.

facilities

holding and transmission, B-8

PW holding, B-8

surgical, B-8

swimming, B-9

FAIO. See field artillery intelligence officer.

FALOP. See forward area limited observation program.

FARP. See forward area refueling and rearming point.

FID. See foreign internal defense.

field artillery intelligence officer (FAIO), 4-1

fields of fire (FofF), 4-8 through 4-10, 4-12, 4-23, 4-24
observation and, 4-8 through 4-10, 4-12

fire sacks, A-6

fire support, 1-2, 3-2

fire support coordinator (FSCORD), 3-2

fire support element (FSE), 5-5

five unified commands, D-2

fixed and rotary-wing attack profiles, C-1

FofF. See fields of fire.

follow-on forces, A-27

foreign internal defense (FID), E-1

formal event graphics, 4-62

forward area limited observation program (FALOP), 4-37

forward area refueling and rearming point (FARP), 5-2, C-6, C-7

friendly counterattack, A-27

friendly electronic collection, F-9

friendly FLOT, A-20

friendly objectives, 4-31

FSCCOORD. See fire support coordinator.

FSE. See fire support element.

FSO. See officer.

functional mission requirements, F-1

funnel-fan effect, B-13

gaps, 2-1, 3-1, 4-13, 5-3

gaps in intelligence holdings, 4-53

GCI. See ground-controlled intercept.

graphic data base, 4-8, 5-2

graphic intelligence data bases, 2-2

ground clutter, C-8

ground-controlled intercept (GCI), 4-5, F-3

ground phase, C-34

ground-to-air control points (FAC vehicles), F-7

GS engineer topographic company at corps, 3-2

guerilla tactics, E-12

high-rise area, B-5

high winds aloft, C-14
 high winds and air currents, C-14
 high winds near the ground, C-14
 hospitals, B-8
 host nation government and military, E-1, E-2
 hot spots of contamination, A-5
 hub, B-9
 hub phenomenon, B-9
 IEW tasks, D-3
 industrial or transportation areas, B-6
 infiltration and exfiltration, E-9
 information gaps, 4-13
 inhibits centralized control, B-2
 insurgency, 1-2, B-1
 insurgent escape routes after the attack, E-15
 insurgent logistic site locations, 4-12
 insurgent segregation areas, B-8
 insurgent threat, E-1
 insurgent logistics sustainability, E-4
 intelligence estimate, 1-1, 2-1, 4-15, 5-2
 intelligence preparation of the battlefield (IPB), 1-1, 1-2,
 2-1 through 2-3, 3-1 through 3-3, 4-1 through 4-7, 4-9, 4-13, 4-27, C-2
 air-associated, C-2
 commander's decisionmaking process of, 3-2
 offensive, A-1
 rear area, 5-1, 5-5, G-1
 interdiction, 4-70
 interdicting, 4-73
 interrogation centers, B-8

IPB. See intelligence preparation of the battlefield.

information requirement, 4-1, 5-6

IR. See information requirement.

jamming, 5-5

JOG. See Joint Operations Graphics.

JOG-A (air), C-4, C-5

JOG-G (ground), C-4, C-5

JOG-R (radar), C-4, C-5

joint intelligence centers, 4-7

joint intelligence directorate (J2), D-12

Joint Operations Graphics (JOG), 4-6, C-4

Joint Operations Planning System (JOPS), D-4

Joint Strategic Capabilities Plan (JSCP), D-2

joint task force (JTF), D-3

JOPS. See Joint Operations Planning System.

JSCP. See Joint Strategic Capabilities Plan.

JTF. See joint task force.

KGB. See SPETSNAZ.

killing zones, A-6

landing zone (LZ), 4-3, 5-2
 assault, 5-2, C-6

LC. See line of contact.

LD. See line of departure.

legend, 4-28 through 4-30

LIC. See low-intensity conflict.

line of contact (LC), 4-23

line of departure (LD), 4-23

line of sight (LOS), 4-9, 4-23 through 4-26, A-3
 air and ground, C-5
 horizontal, C-5
 oblique and vertical, 4-24, C-5

lines of communication, 4-7, 4-16, 4-17, 4-23

LOC. See lines of communication.

local insurgent group's capabilities, E-14

loitering on the reverse slopes of hills, 4-10, C-8

LOS. See line of sight.

low-intensity conflict (LIC), B-1

low visibility, 4-33

lumber yards, B-9

LZ. See landing zone.

MAC-V. See Military Assistance Command-Vietnam.

main defensive area, A-6

maneuver, 1-2, 3-1, 4-11, 4-12, 4-19, 4-20, 4-26, 4-30, 5-1, 6-1

map, 2-1, 4-6 through 4-8, 4-15, 4-16, 4-24, 4-29
 cross-country movement (CCM), 4-7
 incident, E-13
 standard city, B-8
 standard military topographic, 4-6
 topographic, 4-6
 transportation, 4-7

MASINT. See measurement and signature intelligence.

masked areas, C-8

mass transit routes, B-8

matrix

 event analysis, 4-59, 4-64, 5-3, A-16
 operational factors, 4-75
 rear operations and rear AO event analysis, G-13
 unit, 4-46, 4-47 5-3
 weather factor analysis, 4-20, 4-36

MC00. See modified combined obstacles overlay.

measurement and signature intelligence (MASINT), 4-26
 medical evacuation, B-8, C-18
 METT-T. See mission, enemy, terrain, troops, time available.
 Military Assistance Command-Vietnam (MAC-V), D-3
 military deception, 5-5
 military police unit commander (G4), G-1
 minefields and barriers, A-6
 minimum critical value, 4-39
 missiles, 4-3, 4-23, 4-26
 air-to-surface, C-18
 long-range, C-18
 surface-to-surface (SSM), 4-27
 mission, enemy, terrain, troops, time available (METT-T), 4-3, 4-4
 mission oriented protection posture (MOPP), 4-35
 missions normally assigned to an MRB as the first echelon, B-21
 missions normally assigned second-echelon MRBs, B-21
 MO. See modus operandi.
 mobility and soil stability, G-5
 modified combined obstacles overlay (MC00), 4-8, 4-27
 classification of, 4-29
 modus operandi (MO), B-27
 MOPP. See mission oriented protection posture.
 most probable course of action, 3-1
 motorized rifle division (MRD), 4-47
 motorized rifle regiment (MRR), 4-49
 defense for a, A-7
 movement rates, 4-19, 4-42
 MRD. See motorized rifle division.
 MRD (primary attack) with RAGS and DAGS, 4-52

MRR. See motorized rifle regiment.

MRR (BMP) main attack prebattle formation (breakthrough), 4-51

MRR tactical march, 4-49

NAI. See named area of interest.

NAI symbols, 4-62

named area of interest (NAI), 4-61, 5-5

rear area, G-10

standard set of, F-1

nap-of-the-earth (NOE) flights, 4-10, C-8, C-9

National Command Authority (NCA), D-1

national military objectives, D-1

National Security Decision Directives (NSDDs), D-4

NBC. See nuclear, biological, and chemical.

neutral nation-states, D-15

NOE. See nap-of-the-earth.

NOE flight, C-8

obstacles that restrict, C-9

noncommunications emitters, F-2

nonstandard air navigation charts, C-5

noncommunications emissions, 4-26

nuclear, biological, and chemical (NBC), 4-1

OB. See order of battle.

observation and Foff, concealment and cover, obstacles, key terrain, and avenues of approach and mobility corridors (OCOKA), 4-8

obstacles, 4-9, 4-11, 4-31, C-8, C-9

rivers and water, 4-31

vertical, C-6

OCOKA. See observation and Foff, concealment and cover, obstacles, key terrain, and avenues of approach and mobility corridors

offensive battlefield, A-2

- offensive battlefield area evaluation, A-2
- offensive trafficability and visibility, A-5
- officer,
 - air defensive, 3-2, C-1, C-5
 - air liaison, 3-2
 - aviation, C-1, C-5
 - CI, 3-2
 - civil affairs, 3-2
 - division or corps G3 air, C-5
 - engineer, 3-2
 - fire support (FSO), 3-2
 - staff weather (SWO), 4-20
- OMG. See operational maneuver group.
- operational document, 4-67
- operational factors, 4-77, 4-78
- operational level of war, 5-5, D-1
- operational maneuver group (OMG), 4-75
- operational sandbox, D-5
- operational vulnerabilities, D-13
- operations
 - air, C-2
 - airborne, 4-36
 - airborne chemical delivery, C-14
 - airmobile, 4-36
 - air resupply, C-15
 - air transport, C-20
 - close-in, 5-1
 - COIN, 1-2
 - collection, 5-3
 - commercial, B-9
 - concept of, 4-1
 - counterinsurgency, E-1
 - combat service support, 5-3, G-3
 - deep, 5-1
 - DSTs for urban, B-31
 - FARP, C-7
 - need to conduct defensive, A-5
 - night, B-25
 - R&S, 5-3
 - rear, 1-1, 3-1, 4-5, 5-1, G-1

- rear area, 5-5, G-1, G-11
- rear area combat support, G-3
- security, 4-5, 4-9, G-3
- situation templating for insurgent or terrorist, B-28
- special considerations for SIGINT and EW, F-2
- theater of, 4-5
- threat evaluation for rear, G-5
- threat urban defensive, B-28
- urban defensive, B-1
- weather analysis for urban, B-19
- weather consideration for rear, G-5

Operations Directorate (J3), D-19

operations order (OPORD), 1-1

operations security (OPSEC), 4-9, 5-5

OPORD. See operations order.

OPSEC. See operations security.

order of battle (OB), 4-1

organization for withdrawal, A-9

overlays

- combined obstacle, 4-19
- climatology-based, 4-37
- direct requests for DMA, 4-16
- horizontal visibility of FofF, 4-9
- hydrology, 4-17
- insurgent concealment and cover, E-4
- LOC, E-4
- logistics sustainability, E-4
- population status, 4-44, B-26, E-4, G-9
- range, A-12
- slope: terrain and weather factor combined, 4-18
- terrain factor, 3-2, 4-7, 4-8, 4-15, 4-16, 4-19, 4-23
- trap, E-4
- vegetation: terrain and weather factor combined, 4-18
- weather factor, 4-16, 4-23, 4-39

parks, B-8

pattern

- closed-order block, B-4
- individual buildings and street layout, B-3
- linear, B-11
- network, B-11
- satellite, B-10
- segment or pie slice, B-11

pattern effects, B-12

phase I, 1-2

Phase II, 1-2

Phase III, 1-2

photographic coverage, 4-6

photomosaics, B-8

physical fatigue, B-7

pilot report (PIREP), 4-37

PIR, See priority intelligence requirement.

PIREP. See pilot report.

placement of elements within rear operations area, G-4

planning
 contingency or peacetime, D-1
 staff, 5-2

planning guidance, 3-1

Planning Terrain Analysis Data Base (PTADB), 4-7

population, 4-12
 civil, 4-4, 5-1
 civilian, E-1

population status, E-3

pop-up tactics, C-8

positions
 insurgent routes into assault, E-15
 mutually supporting company (platoon) defensive, A-6
 small unit defensive, B-2

potential for civil disorder, G-6

precipitation, 4-34, A-5, C-16

priority intelligence requirements (PIRs), 3-1, 5-6

process

decision, 5-2

EW, 5-5

IPB, 1-1, 1-2, 2-1, 2-2, 3-1, 4-1, 4-2, 4-6, 4-7, 4-13, 4-27, 5-5

IPB decisionmaking, 3-2, 3-3

terrain analysis, 4-8

threat analysis, 4-8

threat integration, 4-54

weather analysis, 4-33, 4-36, 4-37, 4-38

psychological operations (PSYOP), 4-4, 4-12, 5-1

psychological strain, B-7

PTADB. See Planning Terrain Analysis Data Base.

PSYOP. See psychological operations.

public baths, B-9

public buildings, B-8

PW. See prisoner of war.

radio electronic combat (REC), 5-5

railroad maintenance yards, B-9

range fans, A-12

rear area

key terrain in the, G-4

rapid entry or exit to the, G-4

theater, 4-5

rear battle environment, 4-10

rear guard, A-9

REC. See radio electronic combat.

reconnaissance and surveillance (R&S), 4-23

reconnaissance by force, B-2

reconnaissance units, B-25

reduced visibility, A-22, C-14

regimental reconnaissance company, A-7

registration marks, 4-28

reinforcing force, A-6

reinforcement options, A-1

requirement to minimize damage, B-2

reserve, B-23

reserve counterattack, A-6

reserve MRBs, B-23

reservoirs, B-9

satellite imagery, 4-37

SBDP. See Soviet Battlefield Development Plan.

school playgrounds, B-8

security, 4-4, 4-12

security echelon, A-6

security force, A-6

senior service support battalion commander (S4), G-1

side-looking airborne radar (SLAR), 4-24

SIGINT. See signals intelligence.

SIGINT tasking, 5-5

signals parametrics analysis of potential critical nodes (SPAN), F-7

SITDEV. See situation development.

sites

- construction, B-9
- POMCUS configured to unit sets, D-11

SITMAP. See situation map.

situation development (SITDEV), 4-60

situation map (SITMAP), 4-44

- insurgent, B-27, E-13
- rear area unconventional warfare, 4-44, G-6

snapshots, 4-55

SOF. See special operations forces.

soil composition of the ground environment, C-9

sorties

number of available, C-35

Soviet Battlefield Development Plan (SBDP), F-7

SPAN. See signals parametrics analysis of potential critical nodes.

special operations forces (SOF), 4-33

special terrain products, B-7

specific aspects, A-22

SPETSNAZ. See KGB special purpose team.

sports fields, B-8

stadiums, B-8

staff estimates, 3-1

staff weather officer (SWO), 4-20, 4-36

steel yards, B-9

strategic centers of gravity, D-21

strategic intelligence community, D-2

strength, E-13

strongpoints, B -25

sunspot activity, F-3

supporting fires, B-26

Supreme High Command (VGK), C-2

SWO. See staff weather officer.

synchronization effort, 3-1

synchronization graphic, 3-2

system

- ADP, 2-1
- air defense weapon, C-18
- cruise missile, C-18
- defensive weapons, A-1
- "look down-shoot down" radar, C-8
- mobility corridor overlay for urban underground, B-18
- sewer, B-8
- subway, B-8
- underground water, B-8

tactical decisions, 5-3

Tactical Terrain Analysis Data Base (TTADB), 4-7

TAI. See target area of interest.

TAI symbols, 4-68

target

- deception, 5-6
- deep, 5-1
- high payoff (HPT), 1-2
- high value EM, F-10
- high value (HVT), 1-2

target acquisition

- air defense, C-6
- obstacles to employment of air defense, C-9

target acquisition and fire control radars, F-2

target area of interest (TAI), 4-68, 5-5

- EW, F-11
- point of area, 4-68
- rear AO, G-13

target value analysis (TVA), 4-69, 5-5

target weather intelligence (TARWI), 4-37

TARWI. See target weather intelligence.

TCAE. See technical control and analysis element.

TCAE's internal analytical effort, F-4

technical control and analysis element (TCAE), F-1

temperature and humidity, 4-35, C-17

template

- air event, 4-63
- doctrinal, 4-43
- electronic node, F-4
- enemy counterattack event, A-15
- ground event, 4-61
- IPB, 2-3
- refined, F-2
- urban battle event, B-28

templating

- decision support, 5-1
- defensive decision support, A-16
- electronic, F-1
- event, 4-59, 5-1
- offensive event, A-16
- situation, 4-54

templating techniques, 5-1

terrain

- decisive, 4-12, A-3
- defensible, A-23
- examples of key, 4-9, 4-11, 4-31, B-15
- NO-GO, 4-30
- rear area, G-4
- SLOW-GO, 4-30
- special implications of urban, B-7

terrain analysis for the urban battle, B-7

terrain constraints, C-35

terrain data bases, 4-7, 4-13

terrain detachment, 3-2

terrain product requirements, 4-13

theaters of military operations (TVD), C-2

"thinking red", A-27

third dimension, 1-1

threat data base, 4-44

threat echelon, 4-45

threat evaluation, 4-42

threat-evaluation for COIN, E-12

threat integration, 4-53

time lines, D-21

time-phase lines (TPLs), 4-61, 4-63

titling data, 4-29

TPLs. See time-phase lines.

"troop control", D-13

TTADB. See Tactical Terrain Analysis Data Base.

TVA. See target value analysis.

TVD. See theaters of military operations.

underground routes, B-26

unengaged forces, A-10

unified commands, D-1

urban combat, B-1, B-7

- high-intensity, B-1
- low-intensity, B-1
- mid-intensity, B-1
- threat evaluation for, B-20

urban insurgency, B-1

urban MCOO development, B-16

urban terrorism, B-1

USAF Air Weather Service (AWS), 3-2

USAF Environmental Technical Applications Center (USAFETAC), 4-37

USAF forward air controller, C-5

utility generation, B-8

VGK. See Supreme High Command.

visual techniques, 4-55

wargaming effort, A-10

wear of MOPP gear, A-5

weather data base development, 4-36

weather data fields, 4-38

weather element (parameter), 4-36

weather team (WETM), 3-2

weather factor analysis matrix development, 4-39

weather factor overlay development, 4-39,

WETM. See weather team.

windblown dust, A-22

wind-generated blowing sand, C-15

winds

- exceptionally high, C-15
- high ground, C-15
- high tail, C-14
- severe head, C-14

wind speed and direction, 4-33, C-14, C-15

window of opportunity, A-1, A-27

withdrawal, A-6, A-8

withdrawal routes, A-1

withdrawing forces, A-9

Worldwide Indications and Monitoring System, D-4



FM 34-130
23 MAY 1989

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

WILLIAM J. MEEHAN II
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:

Active Army, USAR, and ARNG: To be distributed in accordance with DA Form 12-11E, requirements for FM 34-3, Intelligence Analysis (Qty rqr block no. 1119).

☆ U. S. GOVERNMENT PRINTING OFFICE : 1989 O - 242-451 (06235)

3000021625

D

D

D

